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A MONOGRAPH OF THE NORTH AMERICAN EMPIDIDÆ.*

BY AXEL LEONARD MELANDER.

PART I.

Although at the present time a Monograph of the family Empididæ is not, perhaps, so much needed as that of some other Dipteran families, on account of the revision in 1895 by Mr. D. W. Coquillett; yet the material accumulated by Dr. Wm. M. Wheeler during several years, probably the richest collection of Empididæ on this continent, and which he has kindly relinquished—has turned the writer into this channel.

Owing to the number of species in this family, it was thought best to publish the work in two parts. For the second part the genus *Rhamphomyia* alone is left, taking *Rhamphomyia* in its broad sense as those Empidinæ with long proboscis, in which the third vein is unforked. But as this genus is one of the largest of the genera of the animal kingdom, the parts are nearly balanced.

The fine collection of these flies contains material gathered together by Dr. Wheeler since 1890, representing the endeavors of himself and of Messrs. J. M. Aldrich, C. F. Baker, C. Chagnon, James Hine, G. de N. Hough, C. W. Johnson, G. R. Pilate, W. A. Snow, H. E. Summers, S. W. Williston and Mrs. A. T. Slosson, to all of whom our greatest thanks are due.

This collection has been supplemented by most of the Empididæ gathered for the Biologia Centrali-Americana of Messrs. Godman and Salvin by Messrs. H. H. Smith and F. Gaumer. However, although so rich in material the collection is still far from being complete. Many of the previously described species are not represented. This results not from any negligence on the part of the collectors, but because the regions explored are widely separated, and because, in most cases, the collecting was confined to a few months of the year. The zeal of the collectors is apparent from the fact that of the one hundred and ninety species (omitting some of the unrecognizable ones of Francis Walker) described before our work

* Contribution from the Zoological Laboratory of the Univ. of Texas, No. 26.

on this family, and distributed among the genera treated in this paper, seventy-four, or nearly forty per cent. are represented in the collection. Besides these described species we have discovered eighty new forms. The fact alone, that in a collection of insects, even as superficial as this one necessarily is, and representing a family so recently revised, more than half of the species are new shows the enormous work yet to be done in systematic dipterology. Five genera, previously unknown from this continent, are here added, and in addition four new genera are established. Another genus is erected, but as the insect represented was taken in Brazil, it does not properly come within the confines of this paper, and has therefore been added as a foot-note. Several changes in synonymy have also been effected. As an interesting note in this connection attention may be called to the fact that thirty-one years ago only eighteen genera were known to Dr. H. Loew* as occurring in North America, as compared with the thirty-seven now given. Will the genera again be doubled in the next thirty years?

In this paper I have attempted to gather the descriptions made by former observers, and to reduce all to English, in some cases abbreviating the original. The analytical keys are in large part based upon Mr. Schiner's excellent work on the Austrian Flies, a work which has been partially followed also in preparing the generic diagnoses.

The family Empididæ includes rather small to moderate sized flies. The smallest species of the family belong to *Drapetis* and measure only $\frac{1}{25}$ inch. The largest forms reach a length of $\frac{1}{2}$ inch. With the exception of a few brilliant, metallic Mexican species, most of the species are very modest in coloration, a sombre gray-black being the most prevalent color.

Their habitus is generally the following : an almost spherical head with large eyes, generally long pointed antennæ and a slender proboscis, directed either forward or downward ; a slender body, the thorax large, the abdomen long, terminating sharply in the female and more or less club shaped in the male ; the legs generally very long and slender, especially the hinder pair, though not so noticeably long as in the Dolichopodid flies.

The structural characters of the family present a wide range of variation. Perhaps the principal morphological character of a dip-

* Monogr. Dipt. N. Am., No. 1.

teron lies in the structure and neuration of the wings. We are mainly assisted by the venation in assigning a fly its systematic position, and this is because the veins in an insect's wing have become fixed through long periods of evolutionary change. If we take venation as our chief criterion, the family Empididæ consists of an incongruous assortment of genera. This is much more marked than in most other families of Diptera, so much so that what is now given as one family was formerly divided into three. In groups like the Dolichopodidæ or Syrphidæ venation is of paramount importance, and exhibits relatively little variation for all the members of the family. But in the Empididæ the number and the arrangement of the veins may vary considerably. The larger genera have the full number of veins and cells, but in the smaller forms there is a basal coalescence of the posterior veins, until the anal cell vanishes and the posterior cells become reduced to two. The next character in which Empididæ are variable is the structure of the antennæ. Here, again, the larger genera have normal three-jointed antennæ, of which the third joint is typically longer than the first or second, and bears a variable terminal style or arista. In many of the smaller genera the antennæ are reduced in length, the first and second joints may become fused into one, and the arista may become even sub-dorsal, in which case these insects, superficially at least, bear a close resemblance to the smaller Muscidæ, a resemblance which is heightened by the similarity of the wings.

Work on the homology of the parts of the male hypopygium in the different genera and families of flies has made but little advance as yet. That much is to be accomplished in this line may be judged from the similar work in other groups, as for example, the happy results obtained by Prof. J. B. Smith from the study of *Lachnosterna*, and especially since the Empididæ present so large a number of interesting and anomalous forms. Even in a single genus, we may cite here *Platypalpus* or *Empis*, there is a wide range in the plasticity of similar parts. For this reason we have laid greater stress than usual upon the conformation of the male genitalia, relying not so much, however, on verbal description as upon the series of figures of the various forms.

With these words of introduction we may come to a definition of the family. Empididæ are distinguished as such from all other flies by the following combination of characters: Body chitinous; an-

tennæ two- or three-jointed, the outer joint simple, not ringed, and provided with a terminal or sub-dorsal arista of various length; vertex not hollowed; empodia small, at least never swollen; never more than four posterior cells present in the wings, all of which are open; anal canal closed far from the border if present (except in the *Mythicomyiinæ*); second basal cell not confluent with the discal cell if we except some of the species of *Hemerodromia*.

In addition to these points, there are other characters peculiar to the family. The body is rather long and slender, the thorax generally very prominent. The head is nearly spherical and attached loosely to the thorax. Although never minute the head is often small, a character made pronounced by the large thorax. The eyes often occupy nearly the whole head, sometimes the males are holoptic, sometimes dichoptic; in some cases the eyes of the female are contiguous below the antennæ. Generally the females are dichoptic. Of one species both sexes may have similar eyes, or the female may be dichoptic and the male holoptic. At the insertion of the antennæ there is an emargination of the eyes, more or less deep and wide. The eyes are nearly always bare and composed of small ommatidia, which may be of uniform size or rarely larger above. Three ocelli are present. On account of the variation in the size of the eye there is a corresponding difference in the construction of the genæ. These are largest in *Coloboneura*, whereas in many of the Empididæ the eyes reach the oral margin, and the cheeks disappear. The mouth-opening is small; in some species, such as *Platypalpus hians*, it is relatively larger. The mouth may be surrounded by small bristles, but no large oral vibrassæ are ever present. The face is without a mystax, but in *Empimorpha* it is covered with long hair. The proboscis, which is generally adapted for piercing, is variable in length and structure. Sometimes it is minute and thickened, often it surpasses the head and thorax, in which case it is either directed backward or downward and is slender, or, more rarely, it is directed forward and is then generally moderately thickened. Palpi one- to three-jointed, bristly or not, projecting forward or applied to the proboscis, ribbon like and slender, to oval, short, and broad. Antennæ porrect, generally diverging, approximated at the base, of various shapes, generally three-jointed, often two-jointed. Most often the basal joints are short and the third joint longer, rarely the third joint is the shortest. The antennal appendage consists of a

style or arista, terminal, except in a few genera, where it is sub-dorsal. It may be short, stubby, thick, and two-jointed, as the style, or slender and hair like, and several times the length of the antenna, as the arista. In one case (*Hilara Johnsoni*) the arista is spirally curled. The arista is never plumose. The basal antennal joints may be more or less bristly, but this is not the case with the third joint; this joint varies greatly in shape, it may be short and stunted, rather large and globose, oval, or lanceolate. The face may be obliterated by the contiguity of the eyes, or may be broad and convex, with the clypeus prominent, nearly always bare. On the occiput the postocular bristles are more or less prominent, as are also the ocellar bristles.

The thorax is often prominent, larger than the remainder of the body and hunchbacked; though sometimes more or less flattened dorsally. The humeral angles may be prominent. The dorsum and pleuræ are generally covered with glaucous pollen. The arrangement and the size of the bristles and hairs are extremely variable. The margin of the scutellum is provided with from two to very many bristles.

The abdomen is generally long, and slender and more or less cylindrical, sometimes broad and flat, consisting of five to seven segments, its hairiness variable. Ovipositor simple, generally small, sometimes projecting as in *Leptopeza*; hypopygium prominent, often large and extremely complex, generally reflexed over the abdomen. The ventral spots so characteristic of most dolichopodid genera are conspicuously present in *Coloboneura* and many *Empis*.

Legs of varying structure, often the coxæ and femora are elongated, often the femora are thickened and provided with spines below; in *Hemerodromia* the front ones are enlarged, in *Platypalpus* the middle ones, in *Hybos* the hind ones, in *Pachymeria* all, etc.; the metatarsi of the males of *Hilara* and some *Empis* are peculiarly enlarged; the legs of various species are provided with characteristic ornaments, the femora and tibiæ of some females being ciliated with scale-like hairs, while of some males they are armed with projecting structures. The arrangement of the bristles is variable, as is the amount of hair present. Pulvilli moderate, empodia small, ungues plain.

Wings normally parallel with the body, rather large, long, and narrow; neuration variable. The discal cell may be present or

absent, one or two submarginal cells, and two to four posterior cells may be present, the anal cell present or wanting; if present closed far from the border of the wing (except in the *Mythicomyinæ* which properly do not come within the limits of this family). The front border of the wing is provided with small bristles, which in at least one species takes on the character of curved hooks. The formation of the anal angle is of generic distinction, it may be rectangularly developed or diminished to an even curve. Tegulæ small, simple, not conspicuously ciliated, halteres simple.

Little is known of the metamorphoses of the Empidæ. The larvæ are said to resemble those of the Asilidæ. They have been found in rich earth, under leaves and other decaying vegetable matter. The pupæ are free, and with two porrect points at the anterior end.

The Empididæ are all predaceous flies, though at times they are found about flowers. Many of the species fly in swarms in an aerial dance over brooks or shrubbery. Some of the smaller forms fly close to the ground and alight on stones. All are rather sluggish in movement and therefore easy to catch.

As an example of the habits of these flies we may cite *Hilara trivitatta*, the most conspicuous of the early spring insects of central Texas, and the only one that appears in numbers at that time of the year.

Coming before the Bibios and taking the place of the later-appearing Ephydridæ the flies swarm in immense numbers over the swiftly-running streams. Over open pools, especially where the water moves swiftly, the flies skim along the surface, almost all oriented alike, facing windward. By a gradual zig-zag flight they reach the windward edge of the pool, when some, hovering a moment, are blown back, while the others take a sharp turn and fly to the starting point. A part fly with the feet touching the surface of the water, others skim along a few inches higher. In the sunshine a swarm of the flies can be seen hovering and zig-zagging at a height of several feet above the brook.

When copulating the pair float on the surface, and are swiftly carried down stream. The more curious of the skimming flies come one by one to settle on the drifting pair, and then fly away to some other object. If a bit of grass be sent down stream the flies come one at a time in quick succession to it, impelled either by hunger or by the feeling of assisting a helpless object. This latter point is

shown when a newly-emerged fly of the same species is set adrift. The flies gather about until a ball of dozens of individuals is floating down stream. Soon the ball collides with some object and breaks up; the flies then resume their zig-zag path up stream to their former haunts, while others gather about the floating nymph.

In these *Hilara* swarms the males are much more numerous. Their dilated fore-metatarsi perhaps serve in keeping the flies just touching the water. The females of the European species are said to fly about the bushes along the edges of the streams, but in *trivittata* they mingle with the males in their strange dance. Some of the European species form balloons of spun web somewhat similar to those made by the North American *Empis ærobatica* during courtship, as described by Aldrich and Turley (Am. Nat., Oct., 1899).

Trivittata appears regularly at mid-winter and remains nearly two months hovering over the smaller streams.

In conclusion, I desire to thank Dr. Wheeler for the use of his library, and for similar courtesies Dr. Williston, Mr. Henshaw and Prof. Comstock. For assistance in looking up bibliography I wish to express my thanks also to Miss Mabel Evans and to Mr. Henry Barroll; and especially for the kindness and liberality of the gentlemen whose collections have made this work possible I again tender my earnest appreciation.

Table of Genera.

- Anal cell wanting, or if present very small and always the anal vein wanting.
Fore coxæ shorter than the femora.....(TACHYDROMIINÆ) 6.
- Anal cell complete, when wanting the fore femora are shorter than the fore coxæ.....2.
2. Body without macrochètæ; anal cell reaching the margin.
(MYTHICOMYINÆ) 28.
- Anal cell closed before border when present.....3.
3. Anal angle of wing not projecting, outline of wing more or less cuneiform; fore coxæ greatly lengthened.....(HEMERODROMIINÆ) 11.
- Anal angle more or less developed; wings not cuneiform in outline; fore coxæ shorter than the femora4.
4. Anal cross-vein perpendicular or forming an acute angle with the basal portion of the anal vein; proboscis short; thorax prominent, generally hunchbacked(HYBOTINÆ) 18.
- Anal cross-vein parallel with the hind margin of the wing and forming an obtuse angle or curve with the anal vein; proboscis often elongate; thorax generally not hunchbacked.....(EMPIDINÆ) 29.

TACHYDROMIINÆ.

5. A portion of the anal cell present.....**Platypalpus** Macquart.
Anal cell wholly wanting.....6.
6. Second basal cell much shorter than the first; all the femora greatly thickened; thick-set bristly species with small eyes.
Coloboneura gen. nov.
Not such flies.....7.
7. Arista terminal.....8.
Arista dorsal or subdorsal.....10.
8. Front femora greatly thickened; wings sometimes variegated; front coxæ lengthened.....**Tachydromia** Meigen.
Otherwise.....9.
9. Last antennal joint elongate, conical.....**Elaphropeza** Macquart.
Last joint short, oval, or round.....**Drapetis** Meigen.
10. Proboscis short, vertical; palpi broad; front generally of an equal breadth; hypopygium large.....**Stilpon** Loew.
Palpi narrow, slender; hypopygium not greatly enlarged.

Phoneutisca Loew.

HEMERODROMIINÆ.

11. Third longitudinal vein simple, discal cell present, emitting three apical veins.....12.
Third vein forked.....15.
12. Legs very slender, nowhere thickened.....13.
Front femora robust; eyes separated; basal cells long, anal cross-vein perpendicular.....**Litanomyia** gen. nov.
13. Third antennal joint long, acuminate, proboscis incurved.
Synamphotera bicolor Loew.
Third antennal joint short ovate; proboscis vertical.....14.
14. Eyes of the male nearly contiguous; hypopygium swollen, proboscis longer than the head; anal and second basal cells subequal (European species).
Sciodromia Haliday.
Eyes separated; hypopygium small; proboscis short; anal cell shorter than the second basal.....**Oreothalia** gen. nov.
15. Head more or less flattened and horizontal; front femora greatly thickened, bristly beneath, about equalling their coxæ; when the discal cell is present it is narrow, its outer boundary short, nearly perpendicular, and generally emitting two veins to the margin, of which the anterior is furcate, or in some cases three posterior veins are present.
Hemerodromia Meigen (sens. lat.).
Front coxæ short, femora never thickened, not evidently spinose beneath; discal cell always present, moderately large, often pointed apically...16.
16. Scutellum hairy; discal cell emitting only two veins, of which the anterior is furcate.....**Roederiodes** Coquillett.
Scutellum bare, except for the marginal bristles; discal cell sending three veins to the wing margin.....17.
17. Head lengthened, reaching forward; veins two and three undulating; arista very long.....**Ardoptera** Macquart.
Head nearly vertical; arista moderate.....**Clinocera** Meigen (sens. lat.).

HYBOTINÆ.

18. Third vein simple 19.
 Third vein forked 27.
 19. Anal cell shorter than the second basal 24.
 Anal cell as long as the second basal or longer 20.
 20. Fourth vein forked; hind femora not incrassate **Meghyperus** Loew.
 Fourth vein simple; hind femora more or less thickened 21.
 21. Origin of the second vein nearer to the humeral than to the anterior cross-vein.
 Syneches Walker.
 Origin of the second vein not nearer the humeral 22.
 22. Vein between the first and second basals indistinct **Syndyas** Loew.
 Vein between the first and second basals distinct 23.
 23. Stout, bronzed species with enormously thickened hind femora (Brazilian).
 Lactistomyia gen. nov.
 More slender species of black or blue-black coloration **Hybos** Meigen.
 24. Three veins at the apex of the discal cell 25.
 Two veins at the apex of the discal cell 26.
 25. Hind legs lengthened; tibiæ straight **Euthyneura** Macquart.
 Hind femora thickened; hind tibiæ bowed **Oedalea** Meigen.
 26. Third antennal joint conical, with a terminal bristle **Leptopeza** Macquart.
 Third antennal joint oval; bristle subdorsal **Ocydromia** Meigen.
 27. Anterior branch of the third vein terminating in the second vein.
 Blepharoprocta Loew.
 Anterior vein terminating in the costa **Brachystoma** Meigen.

MYTHICOMYIINÆ.

28. No discal cell; second vein ending in the costa. **Hilaromorpha** Schiner.
 Discal cell present; second vein ending in the first.
 Mythicomyia Coquillett.

EMPIDINÆ.

29. Discal cell wanting **Cyrtoma** Meigen.
 Discal cell present 30.
 30. Third vein simple 31.
 Third vein furcate 34.
 31. Proboscis not longer than the head, generally extending straight forward. 32.
 Proboscis longer than the head; generally directed backwards; antennæ
 plainly three-jointed 33.
 32. Eyes of the male separated; hypopygium minute.
 Microphorus Macquart.
 Eyes of the male contiguous; hypopygium large, pedunculate, and flexed to
 the right **Holoclera** Schiner.
 33. Face naked **Rhamphomyia** Meigen.
 Face provided with bristly hairs **Neocota** Coquillett.
 34. Proboscis evidently longer than the head 35.
 Proboscis not longer than the head 39.

35. All the legs of nearly equal length; hind femora much thickened.

Pachymeria Stephens.

Hind legs longer than the others, their femora but little or not at all thickened36.

36. Proboscis hanging downward or backward, and slender37.

Proboscis directed forward.....**Iteaphila** Zetterstedt.

37. Face naked38.

Face provided with bristly hairs**Empimorpha** Coquillett.

38. Metallic species..... **Lamprempis** Wheeler and Melander.

Non-metallic species.....**Empis** Linné.

39. Antennæ very short, apparently two-jointed, the last joint ovate, with a short thick style.....**Hormopeza** Zetterstedt.

Antennæ formed otherwise.....40.

40. Proboscis shorter than the head; fore metatarsi of the male not enlarged..41.

Proboscis about as long as the head; fore metatarsi more or less swollen in the male.....**Hilaria** Meigen.

41. Arista short, two-jointed.....**Ragas** Walker.

Arista long, slender**Gloma** Meigen.

TACHYDROMIINÆ.

PHONEUTISCA Loew.

“*Phoneutisca* differs from *Tachypeza* (*i. e.*, *Tachydromia*) by the sub-dorsal seta of the antennæ, the apex of the second vein abruptly recurved, so that the second half of the costa is shorter than the third, the anterior femora less incrassate; it is distinguished from *Drapetis* by the straight narrower proboscis and the narrow elongate palpi.” Loew, Cent. III, 35.

The hypopygium is not enlarged as in *Stilpon*.

Legs and wings in part infuscated.....**bimaculata** Loew.

Legs yellowish, wings clear.....**simplicior** Wh. et M.

Phoneutisca bimaculata Loew (Fig. 1).

Cent. III, 35.

Black, shining, the elongate palpi and the halteres white, anterior knees always and posterior tarsi at base often testaceous. Wings cinereous, with a black costal spot surrounding the abruptly recurved end of the second vein, veins fuscous, third and fourth veins close together and parallel. 2 mm.

Alaska.

Two males from Brookings, South Dakota (May), differ in having the palpi black. The hypopygium, together with the abdomen, forms a small club. There are no exposed parts to the hypopygium. Viewed from behind the outline is an equilateral triangle, the base above.

Phoneutisea simplicior Wheeler et Melander (Fig. 6).

Biol. Cent. Am. 1901, Dipt. Suppl. p. 375.

Black, shining; legs yellow. Antennæ short, black, third joint shorter than the second. Vertex with a purple tinge. Palpi whitish; proboscis black, about one-third the eye-height. Thorax shining black, with a faint purplish reflection, pleuræ lightly pruinose. Halteres pale yellow. Abdomen black, with a bronze tinge. Legs and coxæ yellow, tarsi darker on the last joint. Wings cinereous-hyaline, unspotted, veins strongly fuscous, third and fourth veins straight, slightly divergent. 1.5 mm.

Guerrero and Vera Cruz (Mexico).

STILPON Loew.

Separated from *Drapetis* on account of the sides of the front being parallel, not triangular, and the arista dorsal, and not apical. The hypopygium in at least two of our species is very large, and its parts widely open.

Thorax shining black, hind metatarsi dark2.

Thorax cinerascens, legs yellowish **Houghii** sp. nov.

2. Abdomen testaceous..... **varipes** Loew.

Abdomen piceous..... **pectiniger** sp. nov.

Stilpon varipes Loew.

Cent. II, 58.

Black, abdomen testaceous, halteres fuscous, wings infuscated, second and third sections of the costa subequal. Face white pollinose. Legs yellow, anterior femora strongly incrassate, apex of middle femora and outer half of posterior femora fuscous, anterior tibiæ beyond the base infuscated, posterior tibiæ fuscous, a little thickened at the tip; tarsi subfuscous, first joint fuscous, last joint black, hind metatarsi a little thickened. First longitudinal vein and first section of the costa testaceous, basal half of fourth vein weak, rest of veins fuscous, all the veins broadly bordered with fuscous, except second half of fourth and tip of fifth. 1.7 mm.

Pennsylvania (Osten Sacken).

Stilpon pectiniger sp. nov. (Figs. 4, 5).

Male. Length 1.5 mm.—Black. Eyes contiguous below antennæ. Front but little diverging towards vertex. Antennæ yellow at base, with several stout bristles, apical joint minute, fuscous, the long seta subdorsal. Palpi and proboscis yellow. Thorax shining, abdomen piceous and not shining, except hypopygium, which is very asymmetrical, though smaller than in *Houghii*. Legs wholly yellow, except the hind metatarsi, which are incrassate, and the apical joint of tarsi; front femora thickened; hind femora above and below with a row of strong bristles, hind tibiæ inwardly and outwardly with a row of bristles, though these are not so closely placed, a little swollen at tip; middle tibiæ beneath at tip with several stout short bristles. All bristles are black. Knob of halteres elongate, well chitinized, punctulate, black, shining. Wings cinereous-hyaline, veins fuscous; first longitudinal and first section of costa not testaceous; veins not at all bordered with dusky coloration; fourth longitudinal ends at extreme tip of wing.

Two males; Milwaukee, Wis., VI, 26, 1895. New Bedford, Mass., V, 24, 1896.

This may prove to be the male of *varipes* Loew, though the piceous abdomen and lack of the dark color of the legs and unbordered veins, etc., are sufficient for specific differences in the present state of our knowledge.

***Stilpon Houghii* sp. nov.** (Figs. 2, 3).

Male and Female. Length 2 mm.—Black, not shining. Head, thorax and abdomen cinereous dusted. Face and front cinereous, face broad in both sexes, front narrowed a little above antennæ. Antennæ short, third joint not minute though small, seta shorter than height of head, apical joint and seta infuscated. Proboscis short, thick, bent back, sordid yellow, dusky at apex; palpi sordid yellow. Thorax very bristly. Abdomen shining through the cinereous coating; hypopygium enormously enlarged, shining above. Legs yellowish, tarsi but little dusky towards tip; femora a little thickened, hind femora with a few macrochaetæ on posterior surface; tarsi slender, hind metatarsi not thickened. Halteres yellowish, knob infuscated. Wings hyaline, with an opalescent tinge, nerves pale yellow; basal cells long, subequal.

Two males, one female; New Bedford (June), and Horse Neck Beach (August), Massachusetts.

I take pleasure in dedicating this curious insect to Dr. Garry de N. Hough, who has many times shown his generous spirit to all interested in Dipterology.

DRAPETIS Meigen.

Very small, shining, black or brownish, rather thick-set species. Antennæ two-jointed, shorter than the head; end joint short and rounded, with a simple terminal bristle. Proboscis short, vertical; palpi broadened, bristly at tip, shorter than the proboscis. Eyes narrowly separated in both sexes. Legs with fine pubescence; coxæ not lengthened; hind tibiæ generally ending on the posterior side in a more or less well developed brush-like process, forming a partial sheath around the base of the metatarsus. Third longitudinal vein not forked, no discal nor anal cell, first basal cell shorter than the second.

- Legs mostly black.....2.
 Fore femora more or less yellow.....5.
 2. Halteres black; hind tibiæ with no bristles.....3.
 Halteres white; hind tibiæ lighter, with several bristles on outer side.....4.
 3. Third (fourth) abdominal segment large; fore tibiæ lighter; antennæ larger;
 veins stronger.....**nigra** Meigen.
 Abdominal segments normal; legs uniformly dark; antennæ small; veins
 weak; hypopygium biparted.....**dividua** sp. nov.

4. Third antennal joint oval; hind tarsi and metatarsi with dense brush of yellow hairs on outer side..... **nitida** sp. nov.
 Third antennal joint elongate; hind legs with no brush or with a small one of orange hairs **medetera** sp. nov.
5. Yellow or reddish yellow; fourth abdominal segment black.
flavida Williston.
 Thorax black, abdomen fuscous to black.....6.
6. Third and 4th longitudinals widely divergent; species less than 1½ mm. long....7.
 Third and fourth longitudinals at most subparallel, larger8.
7. Pile of thorax yellow; antennæ fuscous; halteres fuscous.
minuta Williston.
 Pile of thorax black; antennæ black; halteres whitish.. **divergens** Loew.
8. Halteres infuscated.....9.
 Halteres white11.
9. Posterior basal cell but little longer than anterior.....10.
 Second basal cell two times first; costa not thickened.. **latipennis** sp. nov.
10. Abdomen fuscous, shining; antennæ yellowish; pleuræ yellowish; pleuræ yellowish; wings darker at base; legs light yellow.
pubescens Loew.
 Abdomen mostly opaque black; antennæ infuscated; pleuræ black; wings uniform; legs darker; costa thickened between first and second veins; marginal cell at tip of first vein one half the width of submarginal; third and fourth longitudinals ending close together; wings with brownish tinge **apicis** Williston.
11. Legs pure luteous14.
 Posterior femora dark in part.....12.
12. Posterior femora dark at apex, light at base; coxæ yellowish; hind metatarsi darker than other joints.
 Posterior femora reddish at tip, black at base; coxæ black; hairs of thorax intermixed with black; third and fourth veins subparallel; tarsi darker towards tip **unipila** Loew.
13. Stout; 3d and 4th longitudinals converging **femoralis** Wh. et M.
 Less robust; 3d vein straight..... **septentrionalis** sp. nov.
14. Veins fuscous; posterior basal never as much as twice as long as anterior; 3d vein almost straight; hind metatarsi infuscated15.
 Veins faint; posterior basal about twice as long as anterior; 3d vein with a subapical anterior curve; metatarsi not dark.. **spectabilis** sp. nov.
15. Third and fourth longitudinals subparallel; hind tibiæ simple; antennæ black; palpi lutescent **gilvipes** Loew.
 First posterior cell a little narrowed in the margin; hind tibiæ with a short spur; antennæ and palpi infuscated..... **xanthopoda** Williston.

Drapetis nitida sp. nov. (Figs. 10, 14, 21).

Length 2-2.5 mm., wings same. Wholly shining black. Eyes contiguous below and narrowly above antennæ. Front not broad, triangular. Last antennal joint nearly oval, little longer than deep. Occiput not pruinose. Body with short sparse hairs, besides the black macrochætæ. Scutellum with two long bristles. Halteres whitish. Abdomen of male generally blunt, of female generally pointed, segments of subequal length; hypopygium small, shining, legs in

nature specimens totally black. Most of the specimens, however, show a tendency in the tarsi and posterior tibiæ to become lighter in color, even yellow. Legs rather short and stout, front femora thickened more than the others, posterior femora not lengthened, posterior tibiæ on hind apical third beset with a brush of golden hairs and produced to form a yellow sheath about posterior basal part of metatarsi. This ornamentation is variable in size, and generally more evident in the male. Wings cinereous hyaline, veins yellowish to brown, third and fourth subparallel at tip, in some specimens slightly converging, fourth generally attenuate at base.

Fourteen males, twenty-seven females; Monterey Co., Cal., July. Three males; Austin, Texas, March, October. One male; Granite Mountain, Texas, March 30th.

***Drapetis medetera* sp. nov. (Fig. 22).**

Very similar to *nitida*, but readily distinguished by its smaller size and more slender legs. The posterior legs show less tendency toward the brown coloring, especially in the northern specimens, their brush is much reduced, sometimes wanting, and when present of a darker, orange color. The third antennal joint is two to two and one-half times its greatest width and pointed. Length 1.75-2 mm.

Six males, sixteen females; Idaho, Wyoming, Colorado, Arizona. A very unstable form.

***Drapetis nigra* Meigen (Figs. 12, 17, 24).**

Four specimens from Brookings, South Dakota, do not disagree with Meigen's and others' descriptions.

The front is narrow, the eyes are subcontiguous for a long space beneath the antennæ, the hypopygium is much as in *dividua*, there are no thoracic macrochætæ, the scutellum has two apical bristles, the legs are largely piceous and the veins of the wings are strong. For the wing neuration see the figure

***Drapetis dividua* sp. nov. (Fig. 16, 18, 23).**

Length 1.25-1.5 mm.—Obscure black. Antennæ black, third joint cordate, arista nearly two times length of antenna. Eyes narrowly separated above and below antennæ. Proboscis one-half head height, fuscous; palpi piceous, with golden hairs, rather broad. Front narrow. Occiput, thoracic dorsum and abdomen moderately shining, covered with dusky hairs; thorax without macrochætæ, scutellum with two moderately long and several shorter bristles; pleuræ shining, not metallic. Halteres black. Hypopygium horizontally cleft, covered with stiff dusky hairs at base and black ones at tip, the upper portion erect, the lower larger part terminal. Legs black, the tarsi sometimes lighter; none of the femora greatly thickened, no macrochætæ, no brush nor spur on hind tibiæ, hind femora not much bent, hind metatarsi not enlarged, a little compressed. Wings clear hyaline, costa not thickened, marginal cell at tip of first vein twice as wide as submarginal, third longitudinal vein ending much before apex of wing, fourth ends at apex, second basal a little longer than first, third and fourth longitudinal veins slightly diverging, anal angle rather full.

Twenty-five specimens. Moscow, Idaho.

Apicis, niger and *dividua* are quite similar at first sight. Moreover, they constitute a group having the hypopygium cleft.

***Drapetis latipennis* sp. nov.** (Figs. 11, 19).

Length 1.5-2 mm.—Black, shining; legs yellowish brown. Front moderately narrow; vertex and occiput shining, beset with dusky hairs. Eyes narrowly separated below antennæ. Proboscis black, pointed, palpi piceous, with grayish hairs, broad, mouth-parts very small. Antennæ short, piceous; third joint equal to second, flattened above, arista long. Thorax large, shining, black, notum with sparse dusky hairs, no macrochètæ; pleuræ very shining, with no hairs nor pollen; scutellum with two apical bristles; halteres piceous. Abdomen fuscous to black, hairy, segments regular, in the male segments five and six have a slightly whitish cast, in the female segments four and five have whitish borders sometimes; hypopygium not wider than abdomen; anal segments of female black. Front coxæ and femora luteous, middle and posterior coxæ and trochanters piceous, remainder of legs sordid yellow, tarsal joints not darker apically, hind legs as far as second tarsal joint sometimes more or less dark; hind tibiæ with a very small spur on posterior side and a few yellowish hairs near tip. Wings hyaline, broad, anal angle full, second vein terminates nearer first than third, marginal cell at tip of first vein three times the width of submarginal at that point, second basal cell broad, about twice as long as first, third and fourth longitudinals diverging and then subparallel, first posterior cell not narrow in the wing margin; veins not broad, though piceous.

Two males and three females; Lawrence, Kansas. One male; Milwaukee, Wis.

***Drapetis apicis* Williston.**

Trans. Ent. Soc. Lond., 1896, iii, p. 442.

Antennæ brown, third joint small, onion-shaped. Front black, not shining. Eyes contiguous on face. Thorax black, mesonotum moderately shining, scutellum with two bristles; abdomen nearly opaque black. Legs brown, front coxæ, basal part of all the femora, hind tibiæ in part, and the proximal part of the four posterior tarsi yellowish. Front femora thickened on the proximal portion, the under border straight; middle femora less thickened, hind femora rather slender. Wings nearly uniformly tinged with brown; second and third sections of the costa subequal; third and fourth veins nearly parallel, the third terminating at the extreme tip; penultimate section of fourth vein about twice the length of the posterior cross-vein. Palpi, proboscis and halteres brown. Front and hind tibiæ without spurs. Length 2 mm.

St. Vincent, West Indies.

In addition to the characters given in the specific diagnosis, the following will help to distinguish this species from *dividua*:

Costa thickened between first and second veins; marginal cells at tip of first vein one-half the width of the submarginal cell at that

point; third and fourth longitudinal veins ending close together; anal angle not strongly developed.

The antennæ are very small and the wings have a brownish tinge.

***Drapetis pubescens* Loew.**

Cent., ii, 57.

Black, shining. Head black, shining, the hairs of the vertex fuscous. Antennæ dull yellow, the third joint and the seta sub-fuscous. Palpi dark fuscous. Dorsum of the thorax black, shining, covered with short and dense whitish pubescence. Pleuræ very pale yellow, the upper third fuscous, spotted with black. Abdomen dark fuscous, with very short pale pubescence; base of the abdomen often yellowish; ovipositor of the female longer than in the majority of the species, bent somewhat downward, black, the apex brownish. Legs whitish, with short whitish pubescence, the posterior tibiæ bearing a little longer pile above. Halteres fuscous. Wings hyaline, with a gray tinge, the basal third infuscated slightly, the fourth vein sub-arcuate, basal cells equal. Length 2 mm.

New York.

***Drapetis divergens* Loew (Fig. 15).**

Cent. x, 62.

Black, shining. Antennæ short, black, the first two joints a little less black, often fuscous, in immature specimens even reddish. Palpi moderately broad, whitish. Hair of the vertex whitish. Thoracic dorsum closely clothed with short and somewhat appressed white pubescence, and provided above the wings with some pale yellowish hair, blackish by transmitted light. Abdomen black and shining, in immature species whitish toward the base, but the hind margins of the segments always black. Front coxæ wholly, the others, except the base, yellow. Legs yellow, the tarsi almost wholly fuscous; hind femora thicker than the middle ones, front femora thicker than the hind ones, all destitute of any long hair, except the subapical hair of the middle femora; no apical setulæ on the anterior tibiæ; apex of the hind tibiæ simple. Halteres whitish. Wings hyaline, veins yellowish toward the base, otherwise fuscous; the first vein is so little curved, and the second so strongly arched, that the second section of the costa is very short; third longitudinal vein slightly bent, the first portion more strongly recurved than the outer, so that the vein joins the costa far from the apex of the wing and in a rather sharp angle; third and fourth veins strongly diverging toward the apex; posterior basal cell much longer than the anterior. Length 1 mm.

Texas, Alabama, Georgia, New Mexico.

***Drapetis minuta* Williston.**

Trans. Ent. Soc. Lond., 1896, iii, p. 442.

Eyes of male closely contiguous above and below the antennæ. Vertical triangle and occiput black, whitish pruinose. Antennæ light yellow; third joint as long as the first two together, half longer than wide. Thorax black; mesonotum shining, clothed with dark hair. Scutellum with two bristles. Abdomen black, moderately shining. Legs light yellow; all the femora moderately thickened, the front pair more so than the others. Wings nearly hyaline; second vein

deeply concave anteriorly; third vein widely divergent from the fourth, the first posterior cell widely open.

A cotype specimen measures 1.3 mm.

St. Vincent, West Indies.

***Drapetis unipila* Loew.**

Cent. x, 60.

Black, very shining. Antennæ concolorous, the third joint short and ovate. Palpi almost black. Thoracic dorsum provided with short cinereous pile and some scattered longer black hairs. Abdomen black, the second segment, except the apical margin, and the third sometimes at the base, dull whitish. Trochanters reddish-brown. Femora black, except the reddish apex, the front ones strongly thickened towards the base, the hind ones moderately thickened, middle femora not thickened; all the femora provided at the base below with a single hair, the hind one, however, finer and more difficultly seen; moreover, the front femora bear on each side, the middle ones on the front side, a subapical hair, the hind femora bear on the forward side two long hairs, one subapical, the other a little more distant from the apex; the anterior tibiae beyond the reddish base often fuscous and provided with apical setulae; hind ones badius or reddish, above, except the base and apex, often fuscous and there armed with the long hair, much further from the apex than from the base; apex of the hind tibiae dilated, so that the tarsus is inserted not at the apex but a little before it. Anterior tarsi dark brown, toward the base often reddish, hind ones reddish; last joint blackish always, the three preceding often fuscous. Halteres whitish. Wings hyaline, veins pale yellowish brown; first and second longitudinals moderately and evenly curved, the third meeting the costa a little before the apex of the wing, slightly sinuous over all and slightly incurved toward the apex, fourth slightly sinuous, and almost parallel with the third; posterior basal cell much longer than the anterior. Length 2 mm.

Texas.

***Drapetis femoralis* Wheeler et Melander (Fig. 13).**

Biol. Cent.-Am. 1901, Dipt. Suppl. p. 375.

Shining black; front and proboscis black; antennae and palpi fuscous; front broad; halteres whitish; legs yellowish brown, four anterior femora darker above, hind femora darker on distal half, tarsi darker, especially hind metatarsi, which are equal in length to the remainder of the tarsus; hind tibiae with a short thick terminal spur; wings grayish, veins strong, brown, third and fourth veins gently curved towards each other near the tip, posterior basal cell twice the length of the first. 2 mm.

Mexico, Vera Cruz and Tabasco.

The scutellum has four fine marginal hairs. On the outer side the hind tibiae have a strong preapical bristle. The pubescence of the thorax is white.

***Drapetis septentrionalis* sp. nov.**

Very similar to the preceding, but differs in its much smaller, more graceful stature. The hairs of the thorax are less conspicuous, dusky and white inter-

mixed; the marginal bristles of the thorax are stouter and likewise the two on the scutellum. The spur of the hind tibiæ is much reduced. The third and fourth longitudinal veins are straight and diverge but very slightly; the first basal cell is three-fourths as long as the second. Length 1.5 mm.

A single male; Battle Creek, Michigan (J. M. Aldrich).

***Drapetis spectabilis* sp. nov.** (figs. 9, 20).

Length 2-2.5 mm. Very similar to *xanthopodus* Williston, differing as follows:

spectabilis.

Eyes almost touching just above antennæ.
Arista once and a half antenna.
Thorax prominent in front.
Scutellum with two long bristles.
Abdomen depressed.
Wings hyaline.
Nerves flavous.
First posterior wider in margin than at tip of first vein.
Second basal twice first.
Third vein sinuous.
Marginal wider than submarginal cell.
Hind femora not strongly curved.
Hind tibiæ with no subapical bristles.
Hind tibiæ with three long hairs on outer side proximally.
Metatarsi not dark.

xanthopodus.

Eyes wholly separated above.
Arista three times antenna.
Thorax globose.
Scutellum with four long bristles.
Abdomen subcylindrical.
Wings cinereous hyaline.
Nerves saturate fuscous.
First posterior narrower in margin than at tip of first vein.
Second basal shorter.
Third and fourth subparallel.
Marginal not wider than submarginal.
Hind femora bowed, more robust.
Hind tibiæ with two subapical bristles on outer side.
Hind tibiæ without these.
Hind metatarsi darker than rest.

Both species possess a small though well-marked brush of yellow hairs on inner side of posterior tibiæ.

Five males, seven females; Woods Holl and Horseneck Beach, Massachusetts, July-August.

***Drapetis xanthopodus* Williston.**

A specimen from Georgia very closely resembles the type from the Island of St. Vincent, West Indies. The thorax is less brilliant, however, and the legs are more dusky.

One specimen; Galveston, Texas.

In this connection may be noted a slip of the pen in the appendix to Dr. Williston's "Diptera of St. Vincent." *Xanthopodus* is there called *flavipes*, its manuscript name (not *flavipes* of Macquart), and *flavidus* is called *xanthopodus*.

***Drapetis gilvipes* Loew.**

Cent. x, p. 61.

Black, very shining. Antennæ black, shorter than in *unipila*; third joint short and round-ovate; seta very long. Palpi dull yellow. Thoracic dorsum covered with short blackish pubescence; except for the sides and hind margin, devoid of longer black pile. Pleuræ provided with no pollen at all, very shining. Abdomen black and shining, the second, third and fourth segments of the described specimen dusky whitish, the hind margin of each black; in older specimens, perhaps, the whole abdomen is black. Legs, together with the coxæ, strong yellow, the hind metatarsi and the apex of all the tarsi fuscous or almost black. Middle femora stronger, but not thickened, the other femora moderately and evenly thickened. Front and middle tibiæ armed with apical setulæ; apex of the hind tibiæ simple. Halteres whitish. Wings cinereous, veins dark fuscous; first and second veins but very little curved, the third vein nearly straight, meeting the costa a little before the apex of the wing, fourth subparallel with the third, not undulating, the apical third of its last segment, however, bending back slightly; posterior basal cell longer than the anterior. Length 1.3 mm.

Texas, Bosque Co.

***Drapetis flavida* Williston.**

Trans. Ent. Soc. Lond., 1896, p. 308.

Yellow or reddish yellow; head and the fourth abdominal segment black. Occiput, vertical triangle and the front black. Eyes contiguous below the antennæ, subcontiguous above. Antennæ yellow, the third joint sometimes brownish. Thorax reddish yellow, mesonotum shining, with light colored hair and bristles; hind tibiæ in the male with a stout curved spur at the tip; hind femora less thickened than the middle ones; the front pair considerably thickened. Wings hyaline; the outer portions of the third and fourth veins parallel or very slightly divergent. Length 2-2.5 mm.

St. Vincent, Hayti, Vera Cruz, Orizaba, Yucatan, Louisiana.

***ELAPHROPEZA* Meigen.**

Small, *Platypalpus*-like species. Antennæ apparently two jointed, the end joint lengthened, with a long arista. Proboscis shorter than the head, vertical; palpi shorter than the proboscis. Face narrow, vertex a little broader. Legs but little thickened. Wings with unforked third vein and with no discal nor anal cell; cross-veins approximated.

But one species in our fauna. The genus was not discovered on this continent before.

***Elaphropeza montana* sp. nov. (figs. 7, 8).**

Length 2 mm. Black, shining. Eyes contiguous below the antennæ. Proboscis small, black, palpi lutescent. Antennæ yellow or fuscous at the base, third joint lanceolate, conical, black, bearing a short, stout, terminal arista, whose

length equals the third joint. Vertex shining, sides of face nearly parallel; occiput a little pruinose. Dorsum of thorax, pleuræ and abdomen very shining, black; notum devoid of bristles or hairs, though all the specimens may be rubbed; scutellum with two fine, dusky bristles. Hypopygium small, appendages concealed. Legs, including the coxæ, yellow, last joint of tarsi black; legs slender, tibiæ spurless, no bristles, except the small setulæ on the under side of the middle femora—as in *Platypalpus*. Halteres small, whitish. Wings clear hyaline, veins light fuscous, not thick; first basal very little longer than the second, almost its equal in length; third and fourth longitudinals straight, parallel on outer portion; no trace of an anal cell; anal angle not prominent, rounded.

Eight males and one female; Colorado, C. F. Baker.

The structure of the middle legs is very much like that of certain *Platypalpus*.

PLATYPALPUS Macquart.

Rather small flies, the largest species measuring but 4 mm. Body generally black; with yellowish legs. Wings not spotted. Antennæ apparently two-jointed, with a terminal arista. Proboscis shorter than the head. Eyes of both sexes separated on the vertex. Hypopygium not large, forming a rather blunt ending to the abdomen. Front and middle tibiæ much thickened, generally with spines beneath. The middle tibiæ ending in a spur. Wings with the third vein unforked, all the cross veins near the middle of the wing, no discal cell, anal cell present, its cross-vein perpendicular to the wing margin, sixth vein abbreviated more or less basally.

The generic names *Platypalpus* and *Tachydromia* are chosen, not because they are believed the correct solution of an entomological controversy, but rather because most of the North American species have been described under them.

Femora more or less black	2.
Femora wholly yellow	8.
2. Front tibiæ incrassate	3.
Front tibiæ not incrassate	4.
3. Large species	trivialis Loew male.
Small species	pachytenemus Loew.
4. All the tibiæ black	monticola sp. nov.
Tibiæ more or less yellow	5.
5. Third antennal joint short, oval	6.
Third antennal joint lengthed, lanceolate	pluto sp. nov.
6. Second basal cell considerably the longer	incultus Coquillett.
First and second basals subequal	7.
7. Femora with a well-marked black dot; tibiæ yellow	apicalis Loew.
Anterior femora black above, the others black apically; tibiæ black apically (Alaska)	diversipes Coquillett.

8. Thorax yellow in large part9.
 Thorax wholly black.....15.
9. Head black.....11.
 Head yellow.....10.
10. Head narrow..... **tersus** Coquillett.
 Head broad **flavirostris** Loew.
11. Thorax with black vitta.....12.
 Thorax with no vitta.....13.
12. Proboscis mostly yellow..... **mesogrammus** Loew.
 Proboscis black; wings elongate..... **caligatus** sp. nov.
13. Front femora somewhat thickened14.
 Front femora not thickened..... **flavirostris** Loew.
14. Proboscis wholly black..... **laetus** Loew.
 Proboscis yellow at base..... **impexus** sp. nov.
15. Legs slender, femora subequal..... **vicarius** Walker.
 Middle femora at least enlarged.....16.
16. Tibial spur wanting; posterior cross-vein nearly perpendicular17.
 Spur of middle tibiae present; cross-vein oblique.....19.
17. Abdomen wholly shining; thoracic bristles yellow.....18.
 Abdomen pollinose; some bristles black..... **canus** sp. nov.
18. Mouth-opening very large..... **hians** sp. nov.
 Mouth-opening normal..... **inops** sp. nov.
19. Antennæ wholly black.....20.
 Antennæ in part yellow.....25.
20. Tarsi strongly annulate.....21.
 Tarsi uniform or at most weakly annulate.....22.
21. Third antennal joint long, lanceolate **aequalis** Loew.
 Third antennal joint short, oval..... **trivialis** Loew female.
22. Both third and fourth veins subparallel with axis of wings, abdomen not
 pollinose.....23.
 Either third or fourth sinuous, bending backwards; abdomen pollinose.
incurvus sp. nov.
23. Hind metatarsi yellow, at extreme tip dark24.
 Hind metatarsi uniformly dusky..... **gravidus** sp. nov.
24. Species 2 mm. long, wing 2 mm., arista equal to antenna... **hastatus** sp. nov.
 3 mm. long, wings 5 mm., arista longer than antenna... **caligatus** sp. nov.
25. Proboscis black.....26.
 Proboscis yellow **tenellus** sp. nov.
26. Front end of pleura to the posterior side of the front coxæ, also lateral mar-
 gins of the metanotum, encroaching slightly on the pleura, opaque,
 gray pruinose (Alaska)..... **gilvipes** Coquillett.
 The smooth "plaga" much reduced in size.....27.
27. Sixth vein not obsolete at the base.....28.
 Anal cell incomplete; tarsi annulate..... **crassifemoris** Fitch.
28. Middle tarsi of the male black, the front tarsi whitish, of the female all the
 tarsi annulate **discifer** Loew.
 Tarsi more uniform..... **lateralis** Loew.

Platypalpus trivialis Loew (Figs. 26, 34, 43).

Cent. v, 76.

Two males among a lot of *Platypalpus* taken by Dr. Garry de N. Hough on June 12th at New Bedford, Mass., are presumably associated with a large female taken at the same time. The female is evidently the same form as was described by Dr. Loew as *trivialis*. If these males are the other sex of *trivialis*, we have another case of great sexual dimorphism.

Male.—Length 3.5 and 4.5 mm., wings same. Middle and front femora black, except apical fourth; front femora ciliate, with long white hairs beneath; front coxæ black, middle ones piceous, hind ones dusky; front tibiæ even larger than in the female; scutellar bristles rather small in comparison with the size of the species; humeri more conspicuous than usual; hypopygium not large, rounded, with a small stiff fringe of yellow hairs on the left side; under side of second basal cell strongly sinuous; first posterior cell quite wide in its third quarter; costa thickened at insertion of first vein.

The male differs from *pachytenemus* Loew in being double the size. Aside from the following points the description of *pachytenemus* will answer for this species:

Antennæ black; posterior femora wholly yellow; anterior femora strongly incrassate; tibiæ wholly yellow; tarsi yellow, apex of each joint sharply black, the amount of black increasing on the distal joints; anal vein rather strong.

The front femora of the female of *trivialis* are not ciliate, the other femora not blackened, and the second basal not strongly sinuous.

D. C., Maine (O. Sacken).

Mr. Coquillett claims to have received this species from Santa Fé, New Mexico, from Mr. Cockerell.

Platypalpus caligatus sp. nov. (Figs. 27, 35, 46).

The discovery of the male of *trivialis* shows that the insect mentioned in the Biologia Centrali-Americana as related to *trivialis* must be a distinct form. The points of difference are:

Male.—Length 3 mm., wing 5 mm. Legs, including coxæ, yellow, front femora and tibiæ less thickened; cilia of lower occiput, coxæ and femora shorter and fewer in number; tarsi not annulate; scutellar bristles black; hypopygium smaller and with a longer yellow fringe on left side; venation weaker, underside of second basal straight; sides of first posterior cell less sinuous, anal angle less prominent.

Female.—Size of body and of wings as in male. Tarsi not annulate; thoracic macrochaetæ black; anal angle rounded, third and fourth longitudinals less sinuous.

One male, three females; Omilteme and Amula in Guerrero, Mexico. Alt. 6000-8000 feet. July, August, September.

The peculiar variation shown by one specimen may be mentioned again. This individual, apparently the most mature, has the side of the mesonotum and the pleuræ luteous, a curious departure from the usual black thorax. This specimen has also the base of the third vein and the underside of the second basal cell very strong.

Platypalpus pachyememus Loew.

Cent. v, 77.

Black, shining, dorsum of thorax and scutellum opaque, with cinereous pollen. Antennæ fuscous, third joint short, ovate. Coxæ light testaceous, darker basally, femora piceous, apex of all and upper side of the posterior pair testaceous, anterior and middle tibiæ fuscous, anterior tibiæ incrassate, lighter at base and beneath, middle tibiæ with a large spur, posterior tibiæ yellowish, darker at tip; middle tarsi black, posterior tarsi testaceous at base, darker at apex, front tarsi darker at base than at apex. Third longitudinal vein incurved, converging with fourth.

District of Columbia (Osten Sacken).

In the shorter diagnosis Dr. Loew mentions that the first basal cell is the longer. This error is corrected in the main description.

Platypalpus monticola sp. nov. (Fig. 41).

Black, not shining, head and thorax covered with grayish white pollen. Face and front broad, gray pollinose. Antennæ black, third joint defective. Palpi black, with gray hairs; proboscis black, two-thirds the height of the head. Thoracic bristles yellow; scutellum with two long, yellow, terminal bristles. Abdomen and hypopygium shining, black. Halteres reddish. Legs firm, but not much thickened, front femora but little thicker than hind ones, middle femora a little stronger, front tibiæ not incrassate, spur of middle tibiæ moderately strong. Whole of legs black, except the brownish knees. Wings cinereous-hyaline, veins firm, fuscous, third and fourth parallel, nearly straight; second basal cell the longer, its outer vein oblique; anal vein almost wholly gone.

Male and female. Length 1.5-2.5 mm.

Four specimens; Colorado and Cameron Pass, Colorado, July 31st; 11,800 feet.

The only species yet found with black tibiæ.

Platypalpus pluto sp. nov. (Fig. 39).

Black. Antennæ black, third joint lanceolate, lengthened, arista equal to length of the antenna. Face rather narrow, grayish; front moderately gray-brown pollinose; occiput but little shining. Palpi and proboscis small, black. Thorax moderately shining, gray-brown pollinose on dorsum and gray on pleuræ, except usual smooth intercoxal space; its macrochètæ black; scutellum with two terminal bristles. Knob of halteres yellowish white, first joint of pedicel infuscated. Abdomen shining; hypopygium shining, not large; last two seg-

ments of female abdomen not shining, with fuscous hairs, styles short. Coxæ black, front ones anteriorly and middle ones on outer surface with whitish hairs and bristles; all femora black, except reddish at knees; middle femora moderately thickened, front femora less, hind ones not at all; tibiæ reddish, spur on middle ones moderate; tarsi blackish, except dusky at extreme base. Wings hyaline, with faint brownish tinge; veins strong, fuscous, anal vein usually obsolete at base; second basal cell the longer, its outer vein oblique, first posterior cell broadest in the middle, converging towards ends. In the female there is usually a coalescence for a greater or less distance of the costa and first longitudinal. Length 2-2.25 mm.

Sixteen males and eleven females; San Diego Co., California, March.

Seven specimens from Juliaetta, Idaho, appear to belong to this species. The veins are weaker, the legs less strongly black, and the palpi dusky. One female; Albion, Idaho (J. M. Aldrich).

Platypalpus apicalis Loew.

Cent. v, 79.

Black, shining. Head less shining, face closely white pollinose. Antennæ black, the third joint short ovate, the base narrowly luteous. Proboscis black; palpi whitish. Side margins of the thorax and the pleuræ very obsoletely white pollinose, moderately shining. Abdomen shining. Legs, together with the coxæ, yellow, the last tarsal joint black, front and hind femora above marked with an ovate black spot; front femora moderately thickened, middle femora a little thicker than the front ones, with short black hairs below; the apical tooth of the middle tibiæ short. Wings hyaline, veins fuscous, toward the base yellowish, the third and fourth longitudinal veins parallel; first basal cell equal to or a little longer than the second; the posterior basal cross-vein complete; sixth vein abbreviated toward the base. Length 2.2 mm.

Pennsylvania. Common at Wood's Holl, Mass.

Platypalpus diversipes Coquillett.

Proc. Wash. Acad. Sci. vol. ii, 1900, p. 422.

Black, palpi and halteres whitish, legs yellow, bases of coxæ, upper side of the front femora, broad apices of the other femora, of tibiæ, and whole of tarsi, except base of first joint, black; third joint of the antennæ only slightly longer than broad; front femora considerably thickened, about two-thirds as thick as the middle ones; first and second basals subequal, veins yellowish brown. Length 1.5 mm.

Alaska (Kincaid).

Platypalpus incultus Coquillett.

Proc. Nat. Mus. 1896, p. 439.

Black, shining, including the pleuræ. Front coxæ yellowish, others black; front and middle legs yellowish, upper and lower sides of femora blackish brown; tarsi and hind legs, except bases of tibiæ, blackish brown; front femora slightly thicker than the others, middle femora scarcely as thick as the hind ones; legs

destitute of long bristles or pile. Knob of halteres yellow. Veins brown; second basal longer than first by three times the cross-vein at the end of the first. 2 mm.

Southern California; Texas (Brues).

Platypalpus tersus Coquillett.

Proc. Nat. Mus. 1896, p. 439.

Yellow, except eyes and arista black. Third antennal joint short, oval. Front femora twice as thick as the hind ones, middle femora one-half thicker than the front ones. Third and fourth veins parallel, second basal longer than the first; sixth vein obsolete on basal fourth. Length 2-3 mm.

Georgia and North Carolina (Coquillett); Georgia and Louisiana (Pilate).

Platypalpus impexus sp. nov.

Related to *tersus* Coq. and to *lætus* Loew. The following are its distinctive characters:

Head black, yellow-pollinose. Thorax not shining, closely covered with yellowish tomentum. Proboscis yellow, infuscated apically. Pleuræ closely yellow tomentose; the usual clear space is rather small. Front and middle femora subequal, twice as thick as hind femora, middle femora with much reduced spines and with yellowish hairs. Spurs of middle tibiæ smaller than in the allied forms; apex of each tarsal joint narrowly but distinctly black. The fourth vein is slightly sinuous and bends back at the tip, so it there diverges slightly from the third.

One female; Brookings, South Dakota. One female; Battle Creek, Michigan.

Platypalpus lætus Loew.

Cent. v, 81.

Yellow, shining, head cinereous; proboscis black; third joint of antennæ and tarsi piceous; spur of middle tibiæ rather large. Wings yellowish, veins yellow, third vein straight, fourth vein lightly curved towards third; first basal cell a little shorter than the second. Length 2.2 mm.

New Hampshire (Osten Sacken).

Platyaplpus flavirostris Loew.

Cent. v, 80.

Yellow, reddish above, shining, head cinereous, proboscis yellow, last joint of the antennæ black, last joint of the tarsi fuscous, except at base; apical spur of middle tibiæ small. Veins pale yellow, third vein very slightly curved towards the fourth; basal cells equal, sixth vein not obsolete at base. Length 2.6 mm.

New Hampshire (Osten Sacken).

Platypalpus mesogrammus Loew.

Cent. iii, 38.

Yellow, shining. Antennæ, palpi and proboscis, except tip, yellow. Head black. A median thoracic vitta rufescent. Scutellum, except lateral angles and

abdomen, black, shining. Wings hyaline, third and fourth longitudinal veins parallel, straight. Length 1.5 mm.

New Jersey, Pennsylvania, District of Columbia, Tennessee.

***Platypalpus vicarius* Walker.**

Trans. Ent. Soc. Lond., N. Ser., iv, p. 149.

"Black, shining; legs testaceous, slender, nearly equal in size; wings limp, veins testaceous, externo-medial veins very slightly curved." Length 2 mm.

"United States."

***Platypalpus canus* sp. nov. (Figs. 29, 40, 45).**

Length 1.5-2 mm. Head black, base of antennæ, proboscis and palpi yellow; third antennal joint short, more or less fuscous, arista black, equal to antenna; proboscis a little shorter than head-height. Face narrow. Thoracic bristles mostly black; scutellum with two long bristles. Head, thorax and abdomen with slaty pollen, pleuræ completely covered. Halteres pale yellow. Hypopygium piceous, its outer parts freer than usual. Legs, including coxæ, yellowish, tarsi dusky apically, femora slightly thickened, front and middle subequal, hind femora not thickened, front tibiæ incrassate, compressed, a little more slender than the front femora, middle femora beneath with no setulæ, but with dusky setæ, middle tibiæ with no setulæ nor terminal spur. Wings clear, veins light fuscous, anal angle not prominent, anal cell open, second and third veins nearly parallel, posterior cross-vein nearly a continuation of the anterior.

Thirteen specimens; Los Angeles Co., California, December.

***Platypalpus hians* sp. nov. (Figs. 32, 36, 37).**

Length 2-3 mm. Black, shining where tomentum is rubbed. Head, thorax and pleuræ with gray-green tomentum. Face moderately broad, gray pollinose. Proboscis about one-half the head height; palpi short, whitish. Mouth-opening large, as in the Ephydridæ. Antennæ short, basal joint reddish yellow, apical joint lanceolate, pointed, its arista equal to itself. Postocular and thoracic bristles yellow; all on scutellum moderately long. Halteres reddish yellow. Abdomen black, with a greenish reflection, as in also the pleural plaga. Hypopygium rounded. Legs, including front coxæ, reddish; tarsi piceous from tip of first joint, middle and hind coxæ concolorous with pleuræ; femora moderately thickened, middle ones the most, black, setulæ of middle femora prominent, middle tibiæ two-thirds the length of femora, front tibiæ not incrassate. Wings clear, anal angle moderately prominent, veins narrow, fuscous, lighter at base, third and fourth subparallel, first and second basals equal, posterior cross-vein nearly perpendicular to wing margin, anal cell faintly closed.

One male and three females; Colorado.

***Platypalpus inops* sp. nov.**

Closely related to *hians*, but readily distinguished by the following characters:

Face narrow, gray-white pollinose; front narrow. Palpi narrower, longer, pinkish to reddish. Mouth-opening not large. Antennæ black, plainly 3-jointed, arista longer than antenna, third joint short, ovate, blunt. Legs lighter, of a

purser yellow color, tarsi generally markedly annulate; middle tibiae with a trace of an infuscation at tip. The middle tibiae are nearly the length of the femora. Scutellar bristles shorter, especially the lateral ones. Anal angle of wing less prominent, anal vein stronger, and anal cross-vein more oblique. The rest of the neuration is the same.

Seven specimens; Dubois (7200 feet altitude), and Hunter's Creek, Wyoming, September 6-10, 1895 (Wm. M. Wheeler); Oxford, Idaho (J. M. Aldrich).

***Platypalpus incurvus* sp. nov.** (Figs. 31, 33, 44).

Length 2-2.5 mm. Head, thorax and abdomen black. Proboscis short, black; palpi white to piceous. Antennae elongate, black, third joint lanceolate, arista its equal. Face narrow, white to whitish. Vertex and thoracic dorsum with green-brown dust merging to slaty below and on abdomen. Upper portion of occiput with black bristles, lower with white ones; thorax with black bristles. Halteres yellow. Basal half of each abdominal segment with a coating of slaty dust, outer half shining. Hypopygium terminal or flexed to the right, small to moderately large, with a fringe of yellow hairs on left side. Legs light yellow; tarsi slightly dusky, a little darker at tip of each joint, sometimes almost annulate; legs slender, front femora but little thickened, a little larger than front tibiae, which are enlarged and slightly compressed. Wings clear, nerves weak to brown; second basal a little the longer, anal vein generally moderately strong, sometimes the third vein is parallel with the costa, sometimes both the third and fourth are reflexed at the tip, meeting the wing margin beyond the apex of the wing.

Twenty specimens, the males predominating; Los Angeles Co. and San Diego Co., California, December and February.

It seems quite probable that this species is in a state of division. As a general rule the smaller hypopygium, weak venation, straighter third vein and light-colored palpi are correlated, but this is not universally true.

***Platypalpus gravidus* sp. nov.** (Figs. 25, 42).

Black, except legs, wings and halteres. Face grayish, moderately narrow. Palpi dusky red; proboscis a little shorter than head. Third antennal joint lanceolate, in length equal to its arista. Thoracic bristles black. Abdomen shining, with sparse whitish hairs; hypopygium not large. Pleurae slaty, with usual plaga. Legs yellow-testaceous, front coxae more or less black at base, other coxae varying from yellow to black; all the tarsi largely, evenly, dusky to piceous; front femora moderately, middle more strongly, hind not, incrassate; spur of middle tibiae moderate, black at tip. Wings with browish tinge, veins fuscous, strong; third vein straight, except extreme tip, first posterior cell a little wider in the middle, narrower just before apex, second basal cell longer than the first, its outer vein oblique, anal cell open behind. Average length 2.5 mm.

Sixteen males, thirty females; San Diego Co., California, February and March.

Platypalpus lateralis Loew.

Cent. v, 78.

Black, shining. Head subopaque, cinereous. Antennæ black, third joint short, lanceolate, yellow basally. Proboscis black, palpi black. Sides of thorax and greater part of pleuræ opaque white pollinose. Abdomen shining black. Legs including coxæ yellow; tarsi annulate basally, fuscous or black apically, apical spur of the middle tibiæ small. Wings hyaline, veins fuscous, third and fourth subparallel, basal cells equal, sixth vein whole. 2.5 mm.

New Hampshire (Osten Sacken).

Platypalpus discifer Loew.

Cent. iii, 36.

Black, shining, dorsum of thorax, scutellum and metanotum with luteous pollen, occiput and pleuræ with opaque white pollen. Antennæ ochraceous, black at tip. Palpi and legs yellow. Anterior tarsi of male white, and closely white pubescent, middle tarsi of male black, first joint depressed; posterior tarsi of male and all the tarsi of the female black apically. Wings subinfuscated, base of costa and first longitudinal lutescent, rest of veins strong, dark fuscous, third and fourth veins convergent, anal cell complete. 2.6 mm.

District of Columbia (Osten Sacken).

Platypalpus hastatus sp. nov. (Fig. 30).

Black, head and thorax dusted with olive-green tomentum. Face narrow, white dusted, the dust with a slight yellowish shade. Antennæ piceous to black, third joint broad, one and one-half times as long as deep, its height equalling the length of the first joint, arista shorter than antenna. Palpi small, whitish in the male, yellowish red or fuscous in the female. Proboscis black, a little shorter than height of head. Lower part of occiput and of pleuræ slaty-gray pollinose. Scutellum with two long apical yellow bristles. Halteres whitish, broad. Abdomen black, shining, with sparse, short, light-colored hairs; hypopygium shining, flexed to the left, large; genital styles of the female fuscous; venter shining. Legs including coxæ yellow, tarsal joints slightly dusky apically; front coxæ with coating of white hairs anteriorly; femora not greatly thickened, middle ones largest, hind femora not thickened; spur of middle tibiæ moderate. Wings clear, veins light yellow, third and fourth longitudinals nearly straight, subparallel, second basal cell the longer, its outer vein oblique, anal cell open behind, sometimes wanting. 2-2.5 mm.

Four males and six females; Lawrence, Kansas. One female from Craig's Mountain, Idaho.

Platypalpus æqualis Loew.

Cent. v, 75.

Black, shining. Dorsum of thorax with cinereous pollen, pleuræ largely opaque white. Legs and coxæ yellow, tarsi yellow. Antennæ black, third joint lanceolate. Palpi testaceous. Basal cells of wing equal, sixth vein not abbreviated at base, third vein very slightly incurved at apex, subparallel with the fourth. 2.5 mm.

Illinois (Le Baron).

Specimens have been examined from Mass., Mich., Ill., Wisc., La., Neb., Kans., So. Dak., Colo., Wyom., Idaho, N. Mex., Calif., Mexico.

Among these specimens, which doubtless are of a single form, the variations are extreme. Sometimes the tarsi are pure yellow, more often sharply annulate, though at times they are dusky. A few of the specimens from Wyoming have almost black feet. The legs vary from reddish brown to almost white. At times the two basal cells of the wings are equal, more often the second is the longer. The sixth vein is more or less abbreviated at the base. The face varies from white to red or fuscous, and varies also greatly in breadth. The last antennal joint is generally lanceolate, but frequently is short.

Platypalpus crassifemoris Fitch.

Oscinis crassifemoris Fitch, N. Y. Reports, vol. i (1856), p. 301.

Platypalpus debilis Loew, Cent. iii, 37 (1861).

Although Fitch's description of *Oscinis crassifemoris* is very meagre, Mr. Coquillett who had the type for examination places it with *Platypalpus debilis* Loew.

The description of *crassifemoris* is given in full:

"The thick-legged *Oscinis* (*O. crassifemoris*) is the same size with the last (*O. coxendix*, which is 0.07 inch in length to the tip of the abdomen, and 0.10 to the end of the wings), and is black, with a white head, and the thorax with a gray reflection. The last joint of the antennæ with its bristle is black. The legs are pale yellow, the tips of the feet black. The veinlets are so near each other that they are almost united. In the female the abdomen is egg shaped and polished, its apex drawn out into a long, sharp-pointed ovipositor. The middle and anterior thighs are rather short and thick, the hind ones longer and cylindrical.

The specimens referred to this species are variable in tarsal coloring, sometimes the tarsi are yellowish, with dusky tips and sometimes annulate. The antennæ are sometimes black, in which case this species may readily be distinguished from *æqualis* and *hastatus* by the smaller tibial spur and the shape of the third antennal joint.

Massachusetts (Hough), Michigan, Idaho (Aldrich).

Platypalpus tenellus sp. nov. (Figs. 28, 38).

Length 2-2.5 mm., length of wing same.—Black, head, dorsum of thorax and pleuræ covered with gray pollen, abdomen shining. Face silvery, rather narrow; sides of front parallel. Antennæ yellow-red; third form cordiform, pointed, sometimes blackish; arista longer than antenna. Palpi and proboscis yellowish, the latter one-half of the head height. Thoracic bristles yellow.

those of scutellum longer than usual. A clear space present on pleuræ in front of the middle coxæ. Abdomen of male cylindrical, a fringe on left side of hypopygium consisting of white hairs. Legs including coxæ yellow; middle and front femora subequal; front tibiæ a little thickened; spurs of middle trochanters and of middle tibiæ black; tarsal joints sometimes faintly annulate; middle femora with black setulæ, and sparsely ciliate with yellow, middle tibiæ with black setulæ. Wings clear hyaline, veins pale yellow; third and fourth veins parallel, straight; second basal cell a little longer than first, its outer vein oblique; anal cell nearly obsolete; anal angle rounded.

One male and three females; Champaign Co., Illinois, and Brookings, South Dakota.

Platypalpus gilvipes Coquillett.

Proc. Wash. Acad. Sci., 1900, p. 422.

Black, first two joints of the antennæ, palpi, halteres, legs and coxæ yellow, last joint of the tarsi brown; third joint of the antennæ about twice as long as wide. Body polished, the front end of the pleuræ to the posterior side of the front coxæ, also the lateral margins of the metanotum, encroaching slightly on the pleuræ, opaque gray pollinose. Wings hyaline, veins brown, the first and second basals subequal. 2-3 mm.

Popof Is., Alaska (Kincaid).

TACHYDROMIA Meigen.

Rather small, slender flies, devoid of much pubescence, generally black and with the wings more or less colored. Antennæ short, apparently two-jointed, the end joint with a long, outward-pointing style. Proboscis at most as long as the head; palpi with the bristles on the underside sometimes as long as the proboscis. Eyes of both sexes subcontiguous below the antennæ. Abdomen lengthened. Legs rather long, fore coxæ more or less lengthened, fore femora with small spines below. Wings as in *Platypalpus*, except that the anal cell is completely wanting, or only the anal cross vein in part present.

Wings without cross-bands.....	2.
Wings with two broad dark cross-bands.....	14.
2. Thorax reddish	Bacis Walker.
Thorax black	3.
3. Veins bordered with brownish.....	4.
Veins not bordered	5.
4. Cross-veins bordered; third antennal joint dark.....	inusta sp. nov.
Antennæ testaceous	vittipennis Walker.
5. Wings unicolorous.....	6.
Outer part of wings more or less brown, clear at base.....	10.
6. Femora and antennæ wholly black	7.
Part of the femora more or less yellow.....	8.

7. Tibiæ and knob of halteres yellow **portæcola** Walker.
Tibiæ and halteres black **Winthemi** Zetterstedt.
8. Front femora marked with black 9.
Front femora wholly yellow **postica** Walker.
9. All the tibiæ yellow **fenestrata** Say.
Middle and hind tibiæ more or less black **similis** Walker.
10. Legs wholly black 11.
Legs more or less yellow 12.
11. Wings with a black spot at last third of costal margin.
 **maculipennis** Walker.
Wings infumated, except the whitish base **clavipes** Loew.
12. Anal cross-vein wanting **pusilla** Loew.
Anal cross-vein present 13.
13. Legs yellowish **rostrata** Loew.
Legs somewhat darkened **rapax** Loew.
14. Marginal cell obliquely truncate; fifth vein ending in hind margin at the
base of the outer dark cross-band **enecator** sp. nov.
Marginal cell narrowed to the tip; fifth vein recurved, ending in the clear
space **Schwarzii** Coquillett.

Tachydromia Schwarzii Coquillett (Fig. 52).

Proc. Nat. Mus., 1895, p. 440.

Shining, black. Head opaque gray pollinose, the cheeks shining. Antennæ fuscous, the third joint short, conical, the apical arista bristle-like, four times as long as the antenna. Legs dark brown, the bases of the tibiæ and of the tarsi, and sometimes of the femora, yellowish. Knob of the halteres whitish. Wings whitish, crossed by two broad brown bands, the first extending from the base of the second vein to slightly beyond the posterior cross-vein, the second extending from slightly beyond the apex of the fifth vein to a short distance beyond the tip of the second vein, leaving the base of the wing, a cross-band just beyond the middle and the tip of the wing whitish; anal cross-vein wanting, the other two of an equal length, the distance between them subequal to that between the small cross-vein and the base of the third vein, the second basal cell longer than the first by twice the length of the cross-vein; distance between the tips of the third and fourth veins equal to one-third of that between the second and third veins; marginal cell about one-half as wide as the submarginal. 2.5 mm.

California, Utah, Idaho, Texas; Guerrero, Mexico.

This is not an uncommon species, as there are numerous specimens in the collection.

The apex of the marginal cell is gradually narrowed by an even curve of the second vein; the fifth vein terminates between the middle and the outer edge of the central clear band.

The two males from Austin, Texas, differ from typical examples of *Schwarzii* in their coloration. The cross bands of the wings are dark plumbeous instead of brown, and the lighter parts of the legs are white instead of brownish. These specimens were running over

the sides of rather large stones at the bottom of a moist ravine in the vicinity of Mount Barker, a habit which has been observed among European species of this genus.

Tachydromia enecator sp. nov.

Female.—Head shining, black, occiput very sparsely pollinose, and with a few stiff black hairs, cheeks large; proboscis and palpi black, palpi as long as the proboscis and appressed to it, provided with short black hairs; antennæ short, black, the outer joint short, with the slender bristle-like arista more than four times the length of the antenna. Thorax, pleuræ, scutellum and abdomen shining black. Legs shining, black, except the knees narrowly piceous, and the metatarsi at the base piceous; middle and fore femora and tibiæ on their inner edge with evident short spinose hairs. Halteres black. Wings marked with brown as in *Schwarzii*, but differing in venation: near the apex of the marginal cell the second longitudinal vein turns sharply obliquely forward, and at the turn is provided with a short adventitious spur jutting into the submarginal cell. The third vein is slightly reflexed at the tip so that the first posterior cell is slightly broader at its apex than just before, the fifth vein has not so strong a bend near its base as is the case in *Schwarzii*, and therefore terminates in the wing margin within the dark cloud; anal cell completely wanting, the distance between the two basal cross-veins longer than the strong basal section of the third vein; the distance between the tips of the third and fourth veins equal to fully one-third of that between the second and third veins (in *Schwarzii* it is somewhat more than one-third).

Two females; St. John's Co., Quebec (G. Chagnon); Lance Creek, Wyoming (Wheeler).

Tachydromia Bacis Walker.

List of Dipterous Insects in the Collection of the British Museum, iii, p. 510.

"Body dark ferruginous; eyes dark red; lip tawny, as long as the head; feelers black; first and second joints dark tawny; third joint broad, nearly round; bristle very long, more than twice the length of all the preceding joints; abdomen piceous above; legs tawny, clothed with short black bristles; hind legs stout and long; wings colourless; wing-ribs ferruginous; veins piceous; poisers tawny. Length of the body $1\frac{1}{2}$ lines; of wing 3 lines.

"Jamaica (Gosse)."

Tachydromia vittipennis Walker.

Trans. Ent. Soc. Lond., N. S., iv, p. 149.

"Black; antennæ and legs testaceous; wings gray, darker along the borders of the veins; halteres whitish. Length of the body 2 lines; of the wing 4 lines.

"U. S."

Tachydromia inusta sp. nov. (Figs. 50, 54).

Length 3-4 mm.—Black. Inner joint of antennæ reddish yellow, outer fuscous, rounded; style four times antenna. Palpi white, proboscis fuscous. Occiput cinereous-dusted, with a white beard below. Thorax finely and closely dusted, cinereous on the humeri and pleuræ, and lightly bronzed on dorsum;

scutellum with two well-separated erect bristles; tegular cilia golden; halteres light yellow. Abdomen depressed, cylindrical at tip in male, segments shining, interspaces gray dusted; hypopygium shining, terminal, but little larger than abdomen, its ventral fringe small, above with a projection bent to the right. Coxæ yellow; legs yellow, except following fuscous to black places: four anterior femora on outer side, except central yellowish portion, hind femora on tip on basal and apical thirds, four anterior tibiæ on outer side, and tarsi gradually towards tip; front femora much thickened, middle femora moderately, hind ones not; inner side of tibiæ and metatarsi of front legs, and femora and tibiæ of middle legs provided with small black setulæ; middle tibiæ of male with a slight depression before tip on underside. Wings not broad, grayish hyaline, veins strong, piceous, lightly clouded on cross-veins; first posterior cell narrowed towards tip, fourth vein ending just behind wing tip, anal cross-vein strong, a portion of sixth vein beyond anal cross-vein present.

Seventeen males, nineteen females. The sexes taken in copulation. Juliaetta, Moscow and Craig's Mt., Idaho, May. Magdalena Mts., N. Mexico, August.

***Tachydromia portæcola* Walker.**

List Diptera, iii, p. 506.

"Body black, dull; eyes piceous; feelers and mouth black, the latter tawny towards the base; abdomen hairy at tip; legs tawny; thighs slightly piceous; wings gray; wing-ribs and veins piceous; poisers dark tawny. Length of body $1\frac{1}{2}$ lines; of wing 3 lines.

"Hudson's Bay (Barnston)."

***Tachydromia Winthemi* Zetterstedt.**

Dipt. Scand., i, p. 321.

Ins. Lap., 548.

Black. Antennæ, palpi, halteres and legs concolorous, metatarsi flavescent; wings infuscated, third and fourth veins subparallel. Thorax above black, opaque, humeri cinerascens, pleuræ shining, black. Coxæ sometimes yellow apically.

New Hampshire (Osten Sacken).

***Tachydromia postica* Walker (Fig. 53).**

Trans. Ent. Soc. Lond., N. S., iv, p. 149.

"Black; antennæ, abdomen at the base beneath, and legs testaceous; hind femora and hind tibiæ piceous; wings cinereous, veins black, halteres whitish. Length of body $1\frac{1}{2}$ lines; of wings 3 lines.

"U. S."

Four specimens from Lawrence, Kansas, agree with this description, and may probably belong to Walker's species. They are thus further characterized:

Dorsum of thorax and occiput lightly cinereous-dusted, pleuræ

and abdomen shining. Third antennal joint elliptical. Proboscis and palpi yellowish. Beard of lower occiput short, dirty white. Thorax slender, pectus silvery. Scutellum with two well-separated short bristles. Abdomen less shining than the pleuræ, shorter than the thorax, flattened, hypopygium shining, thicker than abdomen at base, much as in *inusta*, but with a dorsal fringe in addition to the larger ventral one. Coxæ yellowish, front tibiæ piceous, front femora relatively thicker than in *inusta*. The underside of the legs is devoid of true setulæ, the front femora beneath pale ciliated. Wings narrow, third vein straight, fourth slightly arching forwards, the distance between the two greater than in *inusta*; veins fuscous, not black; second basal cell longer than the first by the length of the cross-vein; basal cells narrow, sixth vein wanting, anal cross-vein present.

Mr. Coquillett determines as this species specimens received from Prof. Cockerell and taken at Mesilla, New Mexico.

Tachydromia fenestrata Say.

Say, Jour. Acad. Phila., iii, p. 95.

Wiedemann, Aussereuropäische Zweiflügelige Insecten, ii, 12, I.

Black. Antennæ yellow; palpi white, proboscis yellowish, thorax shining black, in certain directions somewhat grayish. Scutellum with two bristles. Pleuræ jet black. Abdomen piceous, darker at apex. Wings brownish. Front femora on inner side with a black line; front tibiæ and hind femora with a piceous line on each side. 4 mm.

Middle States.

Tachydromia similis Walker.

List Dipt. Ins., iii, p. 506.

"Body black, slightly shining; eyes and mouth piceous; feelers tawny, with black tips; legs tawny; tips of feet black; fore thighs striped with black; middle shanks piceous; hind thighs and tips of hind shanks black; wings brown; wing-ribs and veins piceous; poisers tawny. Length of the body $1\frac{1}{4}$ lines; of wings 2 lines.

"Hudson's Bay (Barnston)."

Tachydromia maculipennis Walker.

List, etc., iii, 507.

"Body black, shining; eyes piceous; feelers and mouth black; legs piceous; wings nearly colourless, white at base, each with a large brown spot on fore border at two-thirds the length from the base; wing-ribs and veins piceous, the latter yellow towards the base. Length of body $1\frac{3}{4}$ lines; of wings $1\frac{1}{2}$ lines.

"Hudson's Bay (Barnston)."

Tachydromia clavipes Loew.

Cent., v, 73.

Black, shining; legs including coxæ largely black, apex of anterior tibiæ strongly incrassate, wings beyond the whitish base dark, provided with a posterior basal cross-vein. Antennæ dark fuscous, proboscis black, palpi white. Hypopygium with short black hairs above. 2.6 mm.

Illinois (Le Baron).

Tachydromia pusilla Loew (Fig. 51).

Cent., v, 74.

Shining, black, proboscis and palpi concolorous, no white spot on the pleuræ; coxæ yellow; anterior legs yellow, except the upper side of the femora and tibiæ and the whole of the tarsi; middle legs like front ones, except that the whole of the tibiæ is piceous, femora beneath with black setulæ; hind legs, except luteous base of the femora, piceous. Wings cinereous, outer half of costal margin infuscated, no posterior cross-vein. 2 mm.

Illinois (Le Baron), Snow, Wheeler; Massachusetts (Hough).

Tachydromia rostrata Loew.

Cent., v, 72.

Black, antennæ yellowish, palpi white, proboscis yellow, except tip. Thoracic dorsum subopaque, pleuræ shining. Coxæ yellow; legs yellow, posterior femora and all the tibiæ partly fuscous; middle tibiæ before apex slightly emarginate. This emargination is not readily seen. Wings subfuscous, whitish basally, with a posterior cross-vein. 3 mm.

Hew Hampshire.

Tachydromia rapax Loew (Fig. 55).

Cent., v, 71.

Black; wings subfuscous, at base whitish, with a posterior cross-vein. Coxæ yellow, with a black spot, trochanters black beneath, anterior femora with an apical dot on posterior side, united on under side to a basal dot on the anterior side; front tibiæ fuscous, apical third of posterior tibiæ dark; middle tibiæ excised before apex. 3 mm.

Illinois (Le Baron).

Specimens of this species are in the collection from Massachusetts, Indiana, Illinois, Wisconsin and Wyoming.

COLOBONEURA gen. nov.

Thick set. Head globose, longer than wide, wider than deep; eyes small, two-thirds the head height, inserted forwards and there fore the occiput large; three ocelli present, the posterior two approximated; occiput with stiff black bristles, longer on the upper vertex and between the ocelli; front narrowed mid-way between the ocelli and the antennæ; eyes notched at the antennæ; distance from the antennæ to the bottom of the labrum equal to that from the

antennæ to the ocelli; antennæ directed outwards, short, plainly three-jointed, the third joint not longer than deep, flat above, with a dorso terminal, very slightly and finely pubescent arista, but little longer than the antenna. Labrum prominent, convex, cheeks prominent, straight below; proboscis stout, shining, folding back between the front coxæ, shorter than the head height; palpi short and broad, disc-shaped, hanging down, covered with black hairs and provided with an apical bristle. Thorax stout, cut straight in front, somewhat flattened above, densely black-bristly, a few longer bristles present along the lateral edges of the dorsum, the inner pair of short acrostichals distinct; disc of scutellum, metathorax and abdomen not bristly, scutellum with four marginal bristles. Abdomen flattened, near the centre of the lateral margins of each of the dorsal segments is a small black spot, probably the place of attachment of vertical muscles;* hypopygium small, terminal, ending in a short curved ventral process. Legs stout, all the femora greatly thickened, the hind ones reaching to the end of the abdomen; legs covered with bristly hairs; femora beneath and hind femora above near the tip with macrochætæ, tibiæ on outer side with macrochætæ; tarsi simple, the joints evenly decreasing in length, but not in thickness, pulvilli large. Wings reaching to the end of the abdomen; costa evident and provided with fine dark hairs to beyond the tip of the third vein; no indication of an anal cell; anal angle very broadly rounded, rectangular.

***Coloboneura inusitata* sp. nov. (Figs. 47, 48, 49).**

Male.—Length 3.5 mm. Black, completely covered with silvery-gray pollen, thinning out posteriorly on the abdomen. Antennæ short, black. Proboscis shining, black; palpi piceous, gray pollinose. A small, shining, yellowish, post-humeral callosity present. Hypopygium dark piceous, with a few short, black, stiff hairs on upper left side, which consists of a small convex plate, the under right side more or less flattened and contorted. Coxæ gray pollinose; femora black, becoming fuscous at the knees, tibiæ and tarsi fuscous, last joint piceous; legs shining. Halteres short, whitish. Wings opalescent, first vein, second and third on outer half of the wing, and fifth vein on inner half pale testaceous, remaining veins very faint or wanting altogether; costal bristles black, sharply contrasting with the veins.

Two males; Wood's Holl, Mass., July 13, 1899 (Wheeler); Lake Worth, Florida (Mrs. Annie T. Slosson).

* These abdominal spots remind one of the analogous markings of *Thelyphonus* and the similar ones of many Dolichopod genera, in which cases the spots are indicative of the attachment of the musculature, as the upper spots are connected with the lower by a series of vertical muscles.

HEMERODROMIINÆ.

SYNAMPHOTERA Loew.

The genus *Synamphotera*, strictly speaking, has not yet been taken in America. The species described by Dr. Loew, as referable to his genus, has been placed in the genus *Sciodromia* by Mr. Coquillett; but as it is not this form according to Dr. Loew's own statement it is here left as it was originally placed.

Synamphotera is partly characterized by having the third vein furcate, the third antennal joint small and provided with a very short style, from all of which the following species differs. As Dr. Loew has stated, *Synamphotera* is intermediate between *Hemerodromia* and *Sciodromia*, differing from the former by its slender legs and from the latter in the short incurved proboscis.

Synamphotera bicolor Loew.

Cent., iii, 34.

Black. Front sparsely cinereo-pollinose. The first two joints of the antennæ pale yellowish, the third long, acuminate, black, its terminal seta concolorous, shorter than the third joint. Proboscis somewhat incurved, yellowish; palpi rather long, yellowish. Dorsum of the thorax blackish, faintly cinerascens, with very sparse pollen; the humeri reddish; pleuræ marked with reddish, sometimes wholly reddish. Scutellar margin in some specimens reddish. Abdomen black. Hypopygium of the male concolorous, swollen, reflexed, the upper lamellæ minute, oblong-ovate, yellow. Legs and coxæ pale yellow, the very tip of the tarsi darkened. Wings hyaline, the veins luteous, the third vein simple. 3 mm.

Alaska (Sahlberg).

The form described as *Sciodromia mexicana* does not conform with the typical species of that genus, as the front femora are greatly thickened, the eyes separated, the proboscis shorter than the head, etc. In as much as a closely related form is in the collection it is advisable to construct a new genus for the reception of these American species. This genus may be called *Litanomyia*.

LITANOMYIA gen. nov.

Small, yellow, slender species. Head flattened, the lower part carried in front. Antennæ moderate. Proboscis short, pointed and subincurved. Eyes separated in both sexes, placed forward on the head. Three ocelli present. Occiput with a row of bristles. Thorax more or less cylindrical, shining, feebly pruinose, devoid of acrostichal bristles, but with three dorsal bristles present on each side; two scutellar bristles present. Abdomen slender, cylindrical,

hypopygium somewhat swollen. Legs slender, front coxæ lengthened, as long as their tibiæ, front femora greatly thickened, as long as or but little shorter than their coxæ, bristly and spinose beneath; no tibial spurs, hind tibiæ explanate at the tip. Wings long and slender, cuneiform, third vein simple, discal cell long, not acuminate apically, emitting three simple veins to the wing margin, basal cells elongate, the first basal a little longer than the second, second basal and anal cells subequal, anal cross vein perpendicular to the wing margin, anal vein evanescent, anal angle not developed.

Thorax rufous, with a median dark streak.....**mexicana** Wh. et M.
Thorax yellow, no median darker stripe.....**elongata** sp. nov.

Litanomyia mexicana Wheeler et Melander.

Sciodyromyia mexicana, Biol. Cent. Am., 1901, Dipt. Suppl., p. 376.

Female.—Head black, thorax red, abdomen fuscous, legs yellow. Eyes widely separated on the front, narrowly on the face, rather small. Face silvery, front grayish. Antennæ short, first two joints yellow, third joint pointed, the terminal seta less than twice the length of the antenna. Proboscis very short, yellow. Thorax reddish, pollinose, with black macrochætæ, and with two abbreviated black vittæ in front. Halteres yellowish. Abdomen cylindrical, blunt. Legs lengthened, slender, except the thickened anterior femora; posterior tibiæ with a slight widening at extreme tip; anterior coxæ elongate, yellow, remaining coxæ reddish. Wings grayish hyaline, narrow, somewhat pointed, veins fuscous. 2 mm.

Guerrero, Mexico.

Litanomyia elongata sp. nov.

Quite similar to *L. mexicana*. It differs, however, by its lighter color and more slender form. The thorax is decidedly narrowed in front, whereas in *mexicana* it is rather square. The abdomen is fuscous in but a single specimen, all the others have the abdomen yellow. There is sometimes a fuscous spot present on the dorsum of the sixth abdominal segment. Moreover, the body is much less pruinose, the hind tibiæ lack the terminal swelling, there is no trace of the median thoracic dark stripe, the third antennal joint is rather smaller, the coxæ are concolorous with the legs, the wings are rounded at tip, and generally the costa vaguely paralled with the hind margin. The sides of the face are parallel; in *mexicana* the face is narrower centrally than above or below. The antennæ vary in color from wholly yellow to the third joint black. The thorax is sometimes even lighter medially.

Sixteen specimens; Mass., Wis., S. Dak.

The Massachusetts specimens are slightly lighter in color than the more western ones.

OREOTHALIA gen. nov.

Slender black species of the habitus of *Clinocera*. Head oval, vertical; eyes widely separated, emarginate at the antennæ, extend-

ing to the oral margin, dividing the face from the cheeks; proboscis very short, thick and flat; palpi small, broad; occiput with a row of bristles; ocelli much reduced; antennæ very short, two-jointed, the outer joint small, oval, its terminal style nearly twice the length of the antenna and slender, but thickened at the very base. Thorax rounded, devoid of acrotichals, but with two lateral rows of widely separated bristles; scutellum with two long slender bristles and four minute marginal hairs. Abdomen slender, depressed in the female, and compressed in the male; hypopygium small, terminal but reflected and of less diameter than the abdomen; female abdomen blunt and compressed at the tip. Legs very slender, nowhere thickened, the front coxæ twice as long as the others, and two-thirds as long as their femora; front femora with short spines below, on outer portion no tibial spurs; claws slender, long, empodium well developed, longer than the pulvilli. Wings slender, the third vein simple, discal cell rather long, emitting three simple veins to the margin, the second posterior cell narrow at its base, second basal and anal cells short, their outer boundary continuous, oblique, the anal vein thin and short beyond the cross-vein, anal angle poorly developed.

Oreothalia pelops sp. nov.

Length 8 mm. Wholly black, sparsely coated with fine, dull green pollen. Occipital and thoracic bristles black, abdominal and pedal hairs pale. Halteres black. Hypopygium twisted to the right, elongate, the central filament superior, directed horizontally forward, lamellæ small. Empodia and pulvilli white. Wings infumated, stigmal spot faintly darker, veins dark brown, costal setulæ very minute.

Numerous specimens of both sexes. Kendrick, Idaho (J. M. Aldrich).

HEMERODROMIA Meigen.

Rather small, slender, lengthened species, of yellow, gray or black color. Antennæ with three joints, third oval, pointed, arista short, terminal. Proboscis shorter than the head, curved slightly backwards. Eyes of both sexes not contiguous. Thorax lengthened. Abdomen longer than the thorax, hypopygium larger than the abdomen. Legs long and slender, the fore coxæ much lengthened, equalling or nearly equalling the thickened fore femora. Fore femora and tibiæ usually with minute spines beneath. Wings long and narrow, the third and fourth veins forked, discal cell with two veins, anal angle not well developed.

The European *precatória* Fallen and Walker's *albipes* are included in the table as from North America on Walker's authority. The position of *albipes* was determined from a hint of Dr. Williston, that it is associated with *precatória*, and therefore belongs to the group *Mantipeza*.

- Anal and discal cells present.....(**Mantipeza** Rondani) 10.
 Discal cell united with one of the other cells.2.
 2. Anal cell wanting(**Microdromia** Bigot) 6.
 Anal cell present3.
 3. Second basal emitting three veins.....(**Neoplasta** Coquillett) 4.
 Second basal with two veins, one forked...(**Hemerodromia** Meigen) 5.
 4. Filaments of hypopygium hidden.....**scapularis** Loew.
 Filaments of hypopygium exposed.....**mexicana** sp. nov.
 5. Thorax and abdomen red**defecta** Loew.
 Thorax and abdomen black.....**collusor** sp. nov.
 6. Thorax partly red7.
 Thorax wholly black9.
 7. Femora with a spine-tipped tubercle at base beneath8.
 Femora with no such prominent tubercle.....**empiformis** Say.
 8. Thorax vittate.....**superstitiosa** Say.
 Thorax wholly red.....**rogatoris** Coquillett.
 9. Front femora longer than the coxæ**defessa** Williston.
 Front femora shorter than the coxæ**captus** Coquillett.
 10. Wings wholly clear11.
 Wings with at least a brownish stigma12.
 11. Body uniformly fulvous to black.....**albipes** Walker.
 Thorax reddish in greater part14.
 12. Stigma black**notata** Loew.
 Stigma fuscous.....13.
 13. Body cinereous.....**valida** Loew.
 Body light yellow, thorax brownish.....**præcatória** Fallen.
 14. Thorax darker at the margins, scutellum dark.....**obsoleta** Loew.
 Thorax lighter at the margins, scutellum light.....**palloris** Coquillett.

***Hemerodromia scapularis* Loew (Fig. 59).**

Cent., ii, 54.

Black, shining, humeri either testaceous or fuscous, rarely black, abdomen of male often nearly all black, sometimes the basal segments whitish; abdomen of the female white, black at apex, the ovipositor yellowish, its base and apex broadly black. Antennæ, proboscis, halteres and legs white. Wings hyaline, no stigma, second vein short. 3 mm.

Maryland, Maine, Pennsylvania, Tennessee, Wyoming.

The sixth vein is sometimes wanting.

This species was taken in company with *Hemerodromia collusor*. Three males, ten females.

Hemerodromia mexicana sp. nov. (Figs. 56, 60).

Male.—Length 2.5 mm. Head black, depressed. Face narrow, shining, white, lower occiput thickly covered with white pile. Antennæ and proboscis wholly yellow; last antennal joint but little longer than basal part, cordate. Thorax rather elongate, black, finely punctured; humeri testaceous, mesonotum a little depressed. Abdomen as long as the thorax, piceous, sordid above; hypopygium black, basal filament visible. Legs pale yellow; anterior femora a little thicker than the others, slightly longer than their coxæ; tarsi dusky towards tip; no bristles present. Wings hyaline, as long as the body, hind border somewhat more rounded than in *scapularis*; veins fuscous, no stigma, tip of marginal cell on a line with the end of the second basal, second basal united with the discal, sending three veins to the margin, anal vein attenuated at base.

Very similar to *scapularis* Loew, but differs in its smaller size, rather more robust form, exposed basal filaments of hypopygium, more rounded wings, stronger patch of infraocular pile and less depressed mesonotum.

One male from Orizaba, Mex., December, 1887.

Hemerodromia collusor sp. nov. (Figs. 57, 58, 64)

Length 3.5–4 mm.—Black, thorax covered with bronzed-gray pollen, abdomen finely gray pruinose. Head depressed; vertex and occiput cinereous-dusted; face moderately narrow above, wider below, candid, with slight yellowish tinge. Mouth opening large. Palpi whitish, proboscis reddish, its extreme tip black; proboscis directed backwards, a little longer than the antennæ. Antennæ reddish, short, thick, third joint ovate, pointed, its terminal arista black, thick, short, less than one-half of the length of the third joint. Ground color of the thorax and abdomen black, overlaid with bronzed dust on the notum and cinereous on the pleuræ; mesonotum depressed on the posterior half; scutellum with two closely placed, moderately long, dusky bristles. Abdomen compressed, a little longer than the thorax; hypopygium somewhat shining, erect, with dusky bristles at tip, in height equal to three abdominal segments; ovipositor somewhat recurved, black dorsally, fulvous at base and ventrally. Legs yellowish; front legs raptorial, coxæ two-thirds the length of the femora, femora thickened, with dusky bristles beneath, together with minute black setulæ, tibiæ provided with erect small hairs and an apical bristle; middle and hind legs slender, with no bristles, sometimes the apical joints of the tarsi are dusky. Halteres yellow. Wings hyaline, veins yellow, marginal cell not stunted, third and fourth veins forked, discal cell united with the second basal, sending out two veins to the margin, anal cell complete.

Seven males and fifteen females; taken at Dubois, Wyoming, and Dinwiddie Creek, Wyoming, by Dr. Wheeler, at an altitude of 7200 feet, during the early part of September, 1895.

One female collected by Prof. C. F. Baker in Colorado.

Hemerodromia defecta Loew.

Cent., ii, 55.

Whitish, apex of the hypopygium and the last two joints of the tarsi subfus-

cous. Wings hyaline, the first basal cell longer than the second, stigma obscure. Antennæ and proboscis white. 3 mm.

District of Columbia.

The described specimen is immature.

***Hemerodromia superstitiona* Say.**

Say, Complete Writings, i, 256.

Long's Expedit., ii, Append., 376.

Wiedemann, Ausseur. Zweifl. Ins., ii, 11, I.

Whitish, thorax and abdomen with a broad black vitta; antennæ, proboscis and vertex white, lower part and back of head piceous. The vitta is lighter in color medially. Scutellum with paler margin. On the abdomen the vitta may be constricted to a row of spots. Wings hyaline. Halteres and legs white. 4 mm.

Northwest Territory, not northwest Penn. (cf. Wiedemann).

***Hemerodromia rogatoris* Coquillett (Fig. 65).**

Proc. Nat. Mus., 1896, p. 392.

Head black; thorax, scutellum, metanotum, pleuræ and sternum light red. Abdomen in middle of dorsum brownish red, the seventh segment wholly light yellow. Hypopygium large, projecting both above and below the abdomen, reddish brown. The large blunt tubercle near the base of the front femora bears on its summit a stout spine directed obliquely forward. 4 mm.

North Carolina (Coquillett), Wisconsin, Wyoming (Wheeler).

Of the specimens in the collection the hypopygium is black, with an erect basal filament. No thoracic macrochaetæ are present. The eyes are as in *empiformis* Say, widely separated above the antennæ and very narrowly in the middle below. A mutilated specimen from Louisiana (Pilate) resembles these in the parts remaining. It has, however, strong black bristles on the underside of the front femora.

***Hemerodromia empiformis* Say.**

Ochthera empiformis Say, Compl. Writ., ii, 85.

Hemerodromia vittata Loew, Cent., ii, 56.

" sp. *innominata* Williston, Trans. Ent. Soc. Lond., 1896, p. 440.

(?) *Tachydromia oratoria* Fallen, Empid., 13.

In regard to this species there is another entomological muddle, the following solution of which seems the most practicable. The species was described by Mr. Say as an *Ochthera*, but, as Dr. Loew pointed out, it probably is a Tachydromine. It is put in Osten Sacken's catalogue in the genus *Hemerodromia*, as a synonym of *vittata* Loew. In the Diptera of St. Vincent, Professor Williston describes a *Hemerodromia* from that island, which he suggests is the same as Say's species, and probably the same as *H. oratoria* Fallen.

As there are but a few specimens in the collection which can be referred to Say's *empiformis*, it would be premature to assert that all four species are synonymous, although the specimens agree in all the salient characters with each description.

For this reason there will be no change in the synonymy in the present paper, and the species may still be known as *empiformis* Say.

Empiformis Say.--Body whitish; head cinereous, antennæ whitish, rostrum pale; thorax dusky above; feet white, anterior thighs dilated, robust, emarginate behind the inferior middle for the tip of the tibiæ, and armed beneath with distant, equidistant, rather long setæ, tibiæ incurved at tip and mucronate, armed beneath with approximate, short setæ, intermediate and posterior feet white, tips of the tarsi blackish; abdomen deep black, immaculate. 2.5 mm.

Inhabits Illinois; New York (*vittata* Lw.), St. Vincent (sp. *in-nominata* Willist.), Pennsylvania.

Hemerodromia defessa Williston.

Trans. Ent. Soc. Lond., 1896, p. 439, Pl. XIV, fig. 166.

Head and thorax shining, deep piceous or black, lower part of face and occipital orbits gray pollinose. Eyes broadly contiguous on face. Antennæ light yellow, the third joint as long as the first two together. Bristles of thorax and scutellum wholly inconspicuous. Abdomen opaque black, venter yellow. Legs light yellow. Wings nearly hyaline, anterior cross-vein a little beyond the middle of the basal cells. Proboscis light yellow. 2-3 mm.

St. Vincent, West Indies.

Differs from *captus* Coquillett in the shining head and thorax.

Hemerodromia captus Coquillett.

Proc. Nat. Mus., 1895, p. 391.

Head black, white pollinose. First antennal joint one-half the length of the second, the third two and one-half times as long as the second, broadly oval, the apical third styliform. Eyes widely separated (male). Thorax opaque gray pollinose. Wings hyaline, second basal cell exceeding the first by about twice the length of the cross-vein at the apex of the second.

New York (Coquillett).

Hemerodromia albipes Walker.

List Dipt. Ins., iii, p. 505.

"Body slender, hoary, with a slight tawny tinge; eyes dark red, mouth tawny; feelers pale tawny; black towards tip; legs pale yellow; tips of feet piceous; wings colourless; wing ribs pale yellow; veins tawny, pale yellow towards base; poisers yellow. 3-4 mm.

"Hudson Bay Territory (Barnston)."

Hemerodromia notata Loew.

Cent., ii, 53.

Whitish, a median vitta of the fusco-testaceous thorax, the scutellum, metanotum and the abdomen black. Wings hyaline, discal cell oblong, quadrangular, second posterior cell longer than its petiole; stigma rounded, black. Legs yellowish, last tarsal joints black. 3 mm.

Illinois (Le Baron).

Hemerodromia valida Loew.

Cent., ii, 51.

Stout, cinereous; legs and halteres dark yellow. Discal cell of wings oblong, quadrangular, second posterior cell much shorter than its pedicel, anal cell obliquely truncate, stigma dilutely subfuscous. Dorsum with two narrow, rather obscure vittæ. Posterior tarsi apically fuscous. 4 mm.

Hudson Bay Territory.

Hemerodromia præcatoria Fallen.

Fallen, Empidæ, 10, 12, 34.

Meigen, System. Besch., iii, 62, etc.

Pale yellow. Thoracic dorsum shining, brown, with a median rather broad, grayish vitta. Antennæ yellow, brown apically. Vertex and face silvery. Abdomen above with a broad (brown) stripe, emarginate at incisures. Tarsi hardly darkened towards tip. Wings with brown veins. 4 mm.

Hudson's Bay (*vide* Walker).

Hemerodromia obsoleta Loew.

Cent., ii, 52.

Whitish, subfuscous above, margin of thorax and metanotum black. Wings hyaline. Discal cell oblong, quadrangular, second posterior cell a little shorter than its petiole. Stigma very faint, sublutescent. Legs whitish, last two tarsal joints black. 3.5 mm.

Illinois (Le Baron).

Hemerodromia palloris Coquillett.*Mantipeza palloris* Coq., Proc. Nat. Mus., 1895, 392.

Head black, face, cheeks and lower front yellow, white pollinose. Thorax reddish yellow, marked with two slightly darker vittæ and with a whitish stripe between them; pleuræ reddish yellow; scutellum light yellow; metanotum reddish brown. Abdomen yellow, with a median dorsal indistinct brownish vitta. Legs, halteres, antennæ, proboscis and palpi yellow. Wings hyaline. 4-5 mm.

New Hampshire.

ARDOPTERA Macquart.

Small, slender, almost bristleless flies. Head depressed, oval, the lower part carried in front. Antennæ short, the third joint oval, compressed, the terminal style very long. Proboscis short and thick, directed forwards. Legs slender, long; the fore coxæ shorter

than the femora. Wings long and narrow, with numerous small white spots in the following species; the second and third veins undulating, the third vein forked, sometimes a cross-vein connects the second vein with the anterior branch of the third vein; discal cell long, emitting three veins to the wing margin; basal and anal cells small, separately closed, the anal cell a little longer than the second basal; anal angle poorly developed.

Ardoptera irrorata Fallen.

Fallen, Empid., 13, 17.

Meigen, Syst. Besch., iii, 66, etc.

Black, legs ferruginous. Palpi small, white. Antennæ black. Front black, margined with glistening white. Thorax cylindrical, black, as long as the abdomen, with a median white iridescent vitta. Abdomen black. Halteres white. Wings brown, with scattered white dots. 2.5 mm.

Europe and North America (Loew).

Ræderiodes Coquillett.

Face bare, not separated from the cheeks by a groove; cheeks two-thirds as broad as the eye height; proboscis nearly as long as the height of the head, rigid, the labella not developed; third joint of the antennæ oval, pointed at the apex, the apical style about as long as the remainder of the antenna; no acrostichal bristles, scutellum bearing bristly hairs in addition to the two marginal bristles; wings destitute of a brown stigmal spot, third vein forked, discal cell complete, sending two veins to the wing margin, of which the upper vein is forked, hind cross-vein very oblique, vein at apex of the anal cell nearly perpendicular, sixth vein not prolonged beyond apex of the anal cell; legs slender, destitute of bristles and of long hairs, pulvilli and empodia well developed.

Ræderiodes juncta Coquillett.

Bull. New York State Mus., 1901, No. 47, p. 536.

Black, the coxæ and femora yellow, tibiæ and tarsi brown; head whitish pruinose, the front and upper part of the occiput grayish black; thorax opaque; mesonotum grayish black pruinose, an elongated spot in front of the scutellum, and the pleura whitish pruinose; five pairs of dorso-central bristles; scutellum, except its extreme base, gray pruinose, abdomen opaque, almost velvety; wings grayish hyaline, unmarked. 2.5 mm.

New York (Needham).

The very poorly described *Hemerodromia albipes* Walker may possibly be this species.

CLINOCERA Meigen.

Small, slender, almost glabrous species of gray, olivaceous, or piceous color. Antennæ three-jointed, short, the third joint oval, with a short, outward-pointing bristle. Proboscis thick, short. Eyes of both sexes separated, not or but little emarginate at the antennæ. Thorax elongate, abdomen long and narrow; hypopygium small. Legs long and slender; fore coxæ shorter than the femora. Venation not uniform, the third vein always forked, sometimes a cross-vein present in the first submarginal cell; discal cell sometimes pointed at the tip, sending three veins to the margin, if two, then the first is forked near its base; anal angle not well developed.

Mik's division of *Clinocera** into ten genera is not followed in this paper, as the characters chosen by him from the European species do not seem to be sufficiently correlated in the American forms to justify the adoption of certain of his genera.

Legs including the knees black2.

At least the knees reddish7.

2. Discal cell very oblique apically3.

Discal cell moderately broad toward the tip5.

3. Second and third veins united by a cross-vein, wings spotted.

conjuncta Loew.

Second and third veins free, wings not spotted, anal vein wanting4.

4. Second submarginal cell short.....**simplex** Loew.

Second submarginal cell long.....**lepida** sp. nov.

5. Stigma obsolete, discal cell very long and narrow..**dolicheretma** sp. nov.

Stigma distinct, wings with well-developed spots, discal cell short.....6.

6. Knob of the halteres reddish, second and third veins united by a cross-vein.

taos sp. nov.

Halteres black, only two submarginal cells present.....**lecta** sp. nov.

7. Wings uniformly subfuscous, with no darker spots8.

Wings cinereous or hyaline.....9.

8. Thoracic dorsum evenly opaque**fuscipennis** Loew.

Thorax with three intervittal spaces shining, veins undulating.

lineata Loew.

9. Legs black, only the knees reddish, lower part of the face silvery pollinose.

binotata Loew.

Legs almost altogether testaceous, front black10.

10. Wings hyaline**maculipes** Bigot.

Wings spotted with fuscous.....**maculata** Loew.

Clinocera simplex Loew.

Cent., ii, 49.

(?) *Heliodromia longipes* Walker, List., etc., iii, p. 504.

Olivaceo-cinereous, opaque. Head black, white pollinose, the frontal vitta and

a large occipital spot greenish. Antennæ black. Cheeks broad. Palpi black. Thorax olivaceous, slightly grayish, scutellum, metanotum and pleuræ white-pollinose. Abdomen grayish, with an olivaceous tinge, venter white-pollinose. Hypopygium of the male reflexed, of the same color as the abdomen. Legs slender, black, with short black pile, no apical hairs on the femora, empodium equal to the pulvilli. Halteres piceous, the base paler. Wings cinereous, the stigma obsolete, long, very pale, subfuscous, the first two veins fuscous, the others black, costal setulæ very small, the second longitudinal vein straight, the second submarginal cell short, apex of the discal cell sharp, the second posterior cell cuneiform, no sixth vein. Length 4.3 mm.

Hudson Bay Territory.

It is possible that Walker's *Heliodromia* is Loew's species. The short description of *longipes* agrees very well with that of *simplex*, but in the absence of specimens it would be premature to change the synonymy.

Clinocera lepida sp. nov.

Length 3.5 mm.—Black, covered with dull dark olivaceous pollen on the upper surface and on the legs, and with whitish but not silvery pollen elsewhere, *i. e.*, on the lower part of the face, the cheeks, the pleuræ and the venter. Eyes small, unemarginate, not dividing the large cheeks from the face. Proboscis short, fleshy, black, palpi black. Antennæ distinctly three-jointed, black, the joints subequal, the third joint ovate, arista not longer than the antenna. Acrostichals not developed. Scutellum with only two bristles. Coxæ with a few pale hairs apically. Legs slender, black, front femora a little thickened and with a row of minute fine hairs beneath vanishing apically, sides of the femora devoid of long apical bristles, empodium prominent, golden yellow, larger than the claws or the pulvilli. Halteres wholly black. Wings hyaline, lightly cinereous, unspotted, rather broad, veins black, the third vein thickest, second submarginal cell long; the base of the second submarginal cell, the base of the second posterior, and the apex of the discal cell have almost the same angulation; second basal and anal cells of nearly equal extent apically, anal vein wanting; costal setulæ very minute.

One female; Juliaetta, Idaho (Prof. J. M. Aldrich).

This species agrees with *Chamædipsia* Mik, except for the lack of the characteristic thoracic bristles. From *Clinocera* (sen. strict.) it differs in that the larger cheeks are not constricted off from the clypeus. Both of these characters received much stress from Mr. Mik.

Clinocera dolicheretma sp. nov.

Length 4-5 mm.—Black, coated with olivaceous above and cinereous beneath. Face wholly white dusted. Antennæ very short, black, the joints minute, the arista four times the length of the third joint. Clypeus reaching below the eye, but distinctly separated from the cheeks. Palpi and proboscis black. Occipital bristles dense, scattered over the vertex, the lower cilia prominent. No acrostichal nor intermediate dorso-central bristles; scutellum with two minute bristles.

tles besides the two moderately large marginal ones. Mesonotum with traces of two black vittæ; pleuræ, pectus and coxæ coated with white dust, coxal and metapleural bunch of hairs yellow, prominent. Abdomen cinereous, olivaceous brown above; hypopygium small, slender, completely reflexed, the terminal heel robust. Legs slender, black, the femora black-spinose beneath apically, of the male the front femora have the lower surface provided with pale cilia near the base, no long bristles present; the male front tibiæ are provided with a double row of hairs on the under surface, the front row short, spine-like, the hind row consisting of fine and long hairs; pulvilli minute, empodium as long as the claws. Wings long, slender, hyaline, with a faint infumation, the stigma faint, narrow; veins black, the third vein strongest, the second submarginal cell long, narrow; discal cell very long, not pointed, the first section of its anterior border nearly two-thirds the length of the second section and twice as long as the vein between the second basal and discal cells, the posterior border three times the length of the outward continuation of that vein; anal and second basal cells separately closed, of equal extent, anal vein evanescent.

Numerous specimens. Juliaetta, Idaho (Prof. J. A. Aldrich).

This species apparently belongs to the division *Ræderia* Mik.

***Clinocera conjuncta* Loew.**

Wien. Ent. Monatschr., iv, 80.

Olivaceous, thorax with two black vittæ, pleuræ and coxæ white-pollinose, legs wholly black. Wings fusco-maculate; an obsolete spot between the third and fourth veins behind the cross-vein, a second ascending from the third vein to the fusco-cinereous stigma, a third uniting the basal part of the anterior branch of the third vein with the cross-vein which connects it with the second, a fourth including the veins which close the small and apically very oblique discal cell, a fifth present on the last segment of the fourth vein. Halteres dull yellowish. 4.5 mm.

Washington, D. C. (Osten Sacken).

***Clinocera taos* sp. nov.**

Length 3 mm.—Black, occiput and sides of the mesonotum closely dull dark olivaceous pollinose. Face bare, narrow below the antennæ, the lower part white-pollinose, constricted from the small cheeks. Antennæ short, the basal joints short, the arista a little longer than the antenna. Proboscis and the palpi black. Occiput and pleuræ olivaceous, becoming cinereous on the coxæ, middle of the mesonotum, scutellum, metanotum and abdomen. No acrostichals nor intermediate bristles among the dorso-centrals; scutellum with only two bristles. Legs slender, coxæ with short sparse golden-yellow hairs bunched together apically; no long lateral apical femoral bristles; empodium, pulvilli and claws subequal, minute. Knob of the halteres reddish. Wings moderate, infumated, with three more or less interrupted darker cross-bands, the first including the anterior cross-vein, another somewhat proximal to the posterior cross-vein, the third passing through the abrupt base of the second submarginal cell; veins with a feeble trace of undulation, the anterior branch of the third vein connected with the second vein; discal cell moderately broad, the first section of its anterior border one-half the length of the second section, the hind border one-third longer

than the outward continuation of that vein; anal and second basal cells outwardly nearly flat, closed together, oblique, anal vein indistinct; no costal setulæ.

One female; Franconia, New Hampshire. This species belongs to Mik's resurrected genus *Heliodromia* Haliday.

***Clinocera lecta* sp. nov.**

Length 3 mm.—Black, coated above with dull dark brown pollen becoming cinereous on the face, lower occiput, pectus, pleuræ, coxæ, lateral spot of the mesonotum, metanotum, abdomen, knob of the halteres, and the under side of the front femora. Antennæ short, black, the first two joints minute, arista subequal to the antenna. Eyes large, separating the naked face from the cheeks. Proboscis and palpi black. Occipital bristles short, arranged in a semi-circular marginal row. Mesonotum with two opaque black vittæ, nowhere shining, no achrostichals, the dorsi-centrals without intermediate bristles; scutellum with only two long hairs. Hypopygium recurved, the lower portion produced as a strong heel. Legs slender, black, front femora of the male with minute bristles beneath, and with a small apical fringe of minute hairs on the front side; empodium longer than the claws or pulvilli. Wings hyaline, with three faint spots, the first round, centering about the anterior cross-vein, the second elliptical, passing through the posterior cross-vein and extending from the marginal to the fourth posterior cells, the third spot circular, centering about the base of the second submarginal cell; stigma well-developed, elongate, elliptical; the centers of the cells purer hyaline than the margins; base of the second submarginal cell abrupt, and with a short adventitious spur extending into the first submarginal in the males; second posterior cell broad at the base; discal cell moderately broad and rather long, the first section of its anterior border one-fourth the length of the second section and equal to the externo-anterior edge of the second basal cell; anal and second basal cells closed together, their outward boundary oblique, anal vein imperfect; costal setulæ inconspicuous, very minute. Halteres black.

Two males and one female; Kendrick and Lewiston, Idaho (Prof. J. M. Aldrich).

This species belongs to *Phæobalia* Mik.

***Clinocera binotata* Loew.**

Zeitschr. f. ges. Naturw., 1876, p. 325.

Olivaceous, front and upper half of face black, lower half of face while-pollinose, dorsum of thorax with two narrow black vittæ, abbreviated behind; legs black, apex of all the femora rufescent, anterior femora thicker towards the base, and bearing a few longer hairs below; wings subcinereous, the anterior branch of the third longitudinal vein lined with black near its base, also the adventitious vein by which it is connected with the second longitudinal, and the posterior cross-vein bordered with black. 3 mm.

New York (Osten Sacken).

Two females from Montreal, Quebec, belong to this species. The two scutellar bristles are very long. The face is constricted from

the cheeks, but the clypeus extends below the eyes. The rufescence at the knees is not conspicuously well marked. Halteres black. Discal cell blunt. This is a *Clinocera* in Mik's sense.

***Clinocera maculata* Loew.**

Wien. Ent. Monatschr. iv, 79.

Olivaceous, thorax obsoletely bilineate, pleuræ and coxæ white-pruinose, venter glaucous; femora and tibiæ testaceous, tarsi black. The anterior branch of the third vein is marked with a fuscous spot at its base, ascending to the apex of the second vein, and with another smaller spot at its apex. Halteres black. 3 mm.

Washington, D. C. (Osten Sacken).

***Clinocera lineata* Loew (Figs. 61, 62).**

Cent., ii, 50.

Black, dusted with olivaceous green above, subopaque. Antennæ black, very short; cheeks moderate, together with the face white-pollinose; palpi black. Two shining vittæ on the thoracic dorsum, separated by a black line, and margined outwardly by a black vitta. Scutellum of the same color as the thorax; the lower half of the pleuræ covered with white pollen. Abdomen somewhat shining. Legs slender, almost bare, the base of the coxæ often, the knees, the very apex of the tibiæ and the last joint of the tarsi always fuscous; no setulæ present at the apex of the femora; empodium minute, equal to the pulvilli; claws minute. Halteres dark fuscous. Wings lightly infumated, the veins dark brown, no costal setulæ; the second longitudinal vein sends a cross-vein to the costa of the wing before its end; the third longitudinal vein undulating, the anterior branch reaching forward more than in the other species; a clear spot present in the very apex of the discal cell. 2.3 mm.

Pennsylvania (Osten Sacken). Three specimens from Seattle, Washington, notwithstanding their distant locality, I take to belong to this species.

The postocular bristles are regularly arranged in an interrupted semicircular row of about fifteen in number, and are not supplanted by pale cilia beneath. The two outer vittæ of the thorax bear the dorsal bristles. The cross-vein in the marginal cell is wanting in these western specimens, but its place is indicated by a sharp upward bend of the second vein; but a trace of the anal vein is left.

There is much greater resemblance between *Clinocera appendiculata* Zetterstedt (European) and *Clinocera* (*Ræderia*) *dolicheretma* than between *Clinocera binotata* Loew and *lineata* Loew, yet the former two are generally different, while the latter fall together according to Mr. Mik's arrangement.

Clinocera lineata is intermediate between the other species and

the genus *Ardoptera*, as is seen from its venation, but is more closely related with the *Clinoceras* on account of the conformation of the mouth and the shape of the head.

***Clinocera fuscipennis* Loew.**

Zeitschr. f. ges. Naturw., 1876, p. 324.

Piceous, front and face concolorous, dorsum of thorax not vittate, legs fuscous, wings wholly, uniformly subfuscous, stigma scarcely darker, costa free from setulæ, second submarginal cell narrower than the end of the first, last section of the fourth vein exceeding by a little the length of the discal cell. 2.5 mm.

New Hampshire (Osten Sacken).

***Clinocera maculipes* Bigot.**

Bull. de la Société Zool. de France, 1887.

Black; antennæ, halteres and legs pale yellowish; front black; femora spotted with pale fuscous on the underside near the tip; tarsi narrow, black apically; wings hyaline. 2 mm.

California.

HYBOTINÆ.

***HYBOS* Fabricius.**

Small, slender, almost glabrous species, of generally shining black color. Antennæ short, apparently two-jointed, the terminal bristle long. Eyes bare, contiguous above in both sexes. Thorax prominent, hunched; abdomen long and slender, curved downward. Hind femora long and thick, bristly beneath. Wings unspotted, variable in color; second vein straight, third vein simple; discal cell longer than the second basal, rounded at tip; anal angle large, rectangular.

In as much as Walker, Bellardi and Loew have each described a different species of *Hybos* as *dimidiatus*, it may be well to revise the names here to avoid further confusion. Therefore Walker's species* from Brazil having priority may remain. Loew's *dimidiatus*† originally described from Cuba may be called *electus*; while the Mexican species of Bellardi ‡ may hereafter be known as *sequens*.

Costa rounded, bearing strong spines ***spinicosta* Wh. et Mel.**

Costa straight, without spines 2.

2. Posterior femora strongly toothed beneath, much swollen; wings wholly fuliginous (Brazil) . . . ***Lactistomyia insolita* gen. et sp. nov.**

Posterior femora more slender; wings at least in part hyaline 3.

* Walker, *Insecta Saundersiana*, p. 205, 1856.

† Loew, *Wien. Ent. Monatschr.*, v, 36, 1861.

‡ *Saggio Dipt. Mes.*, ii, 97, 1861.

3. Legs wholly yellow **sequens** nom. nov.
 Legs in part dark brown to black.....4.
4. Halteres yellow5.
 Halteres infuscated.....7.
5. Wings hyaline6.
 Wings gray, though hyaline at base..... **reversus** Walker.
6. Legs wholly black **typicus** Wh. et Mel.
 Tibiæ and tarsi more or less yellow..... **slossonæ** Coquillett.
7. Stigmal spot noticeable8.
 Stigmal spot obsolete **triplex** Walker, varieties.
8. Wings completely hyaline.....9.
 Wings more or less infumated basally.....10.
9. Tibiæ black..... **mellipes** Wh. et Mel.
 Tibiæ fulvous; size smaller **electus** var.
10. Thorax and abdomen with bluish reflections..... **electus** nom. nov.
 Thorax and abdomen black..... **triples** Walker, varieties.

Hybos typicus Wheeler et Melander.

Biol. Cent.-Am. Dipt. Suppl., 1901.

Black cinereous, slender. Antennæ black, short; third joint oval, not longer than the first. Eyes contiguous below antennæ. Proboscis black. Thorax prominent, black, shining through the coating of brown dust; pleuræ cinereous-black. Halteres yellow. Abdomen slender, piceous, slightly pubescent, especially towards apex. Genital apparatus of male small, not giving the abdomen a club-shape, with two projecting filaments. Legs slender, piceous, shining, with scattered pubescence, knees lighter, front tarsi long, metatarsus equal to the tibia, middle tibiæ with two long slender bristles on the external side at basal fourth and half, and three on inner side at half, three-fourths and tip; hind femora not much thickened, not evidently serrate beneath, besides the pubescence a series of about six hairs beneath; hind tarsi not toothed beneath. Wings hyaline, subquadrate, obtusely rounded at apex, anal angle not strong, veins yellowish; third vein terminates beyond the middle, parallel with the fourth; stigmal spot not well developed, not filling out the apex of the marginal cell; discal cell broad; anal vein not evident. The fine hairs around the margin of the wing are not so closely placed as usual. 4.5 mm.

The males have the front legs sparsely ciliate with long hairs; the tibiæ on the posterior side and the metatarsi on both sides.

Guerrero, Mexico (H. H. Smith).

Hybos spinicosta Wheeler et Melander (Fig. 77).

Biol. Cent.-Am., 1901, Dipt. Suppl., p. 374.

Differing from *typicus* as follows:—Face narrower, dusted with silvery-white instead of gray. Legs wholly pitchy-black; the tibial and tarsal bristles are shorter and more numerous. The posterior legs and the abdomen are covered with much shorter hairs; the abdomen not shining, dusted. The hypopygium is terminal and more enlarged. The wings are somewhat infuscated, broader and with peculiar venation; costa bent at tip of first vein, so that the anterior edge of the wing is bowed outwardly, beset with spiny hooks from the junction of the auxiliary vein, these hooks gradually becoming straight at about the middle of

the wing and passing insensibly into the usual fringe of hairs; stigmal spot very broad; second vein strongly curved in a double curve to accommodate itself to the deep stigma, ending much nearer to the tip of the first vein than usual; third vein straight, subparallel with the costa in the outer part of its length; discal cell narrow, the cross-vein at its apex perpendicular to the penultimate section of the fifth vein. The halteres seem to have been dark. 4.5 mm.

Guerrero, Mexico (H. H. Smith).

Hybos mellipes Wheeler et Melander (Fig. 78).

Biol. Cent.-Am., 1901, Dipt. Suppl.

Black, shining, moderately strongly yellow-pilose. The two parts of the antennæ are subequal in length, arista shorter than the eye-height. Eyes contiguous below the antennæ, leaving a small subantennal triangular space shining black. Mesonotum shining black, moderately strongly pilose. Pleuræ black, shining, not cinerous. Pedicel of halteres black, knobs defective. Abdomen shining black, robust, not unusually hairy. Legs except tarsi shining black, strongly hairy; posterior femora incrassate, not strongly spinulose beneath; first two joints of tarsi yellow, remainder blackened. The hairs of the legs are longer laterally, so as to give the legs, especially the tarsi, a ciliated appearance when viewed from the front. Wings narrow, wholly hyaline, except for the fuscous stigma which completely fills the outer third of the marginal cell; veins strong, discal cell narrow. 4 mm.

Guerrero, Mexico (H. H. Smith).

Except for the usual postoculars the pile is yellowish.

Hybos electus nom. nov.

Hybos dimidiatus Loew (nec Bellardi nec Walker), Wien. Ent. Monatschr., v, 36.

Wholly black, very shining, thorax with a greenish, abdomen with a bluish tinge. Pile of the whole body pale, of the abdomen whitish. Legs black, the apex of the femora, the front and middle tibiæ, and the first two joints of the tarsi yellow, the remaining joints blackish. Some longer setæ present near the apices of the anterior and middle tibiæ, and on the anterior metatarsi. Halteres black. Basal half of the wings blackish, apical cinereo-hyaline, stigma very distinct, oblong, black. 3 mm.

Cuba.

Three specimens from St. Vincent Island show variation in the fuscous legs, hyaline wings and slightly smaller size, though they retain the bluish body color of Loew's typical *dimidiatus*.

From this variety two specimens from St. Vincent, four from Tifton, Georgia, and two from New Bedford, Massachusetts, vary in the blackish body color, but are similar to it in other respects.

The extension of this species to the United States is interesting.

Hybos slossonæ Coquillett.

Proc. Nat. Mus., 1895, p. 437.

Head, including the antennæ, proboscis and palpi, black; face broad, whitish

pollinose; proboscis slender, rigid, slightly longer than the height of the head only slightly longer than the palpi. Thorax black, shining, lightly pollinose, the pile rather long, yellowish white; pleuræ black, subshining, lightly pollinose, no long pile in front of halteres; scutellum black, subshining, bearing two long yellowish apical bristles and several shorter ones. Abdomen black, shining, its long pile yellowish white. Coxæ and femora black, apices of front and middle femora yellow; front and middle tibiæ yellow, the hind ones black; tarsi yellow, underside of the first two joints of the hind tarsi beset with small black points, sides of hind metatarsi destitute of long black spines. Knob of halteres yellow. Wings hyaline, the stigma grayish brown. 3-4 mm.

New Hampshire, Massachusetts, Wisconsin; numerous specimens.

Hybos reversus Walker.

List Dipt. Ins., iii, p. 487.

Body black, shining; eyes dark bronze; feelers black; abdomen clothed with long hoary hairs; legs yellow; hips, thighs and hind shanks black; tips of four front thighs yellow; four front shanks tawny towards the base; hind feet and tips of four front feet tawny; wings pale brown, darker along the borders of the veins, colorless at the base; wing-ribs and poisers yellow; veins piceous, yellow towards the base. 4 mm.

Trenton Falls (Walker); Jamesburg, N. J. (C. W. Johnson).

Hybos triplex Walker (Figs. 79, 80, 81).

Hybos purpureus Walker, List Dipt. Ins., iii, p. 486.

Hybos duplex Walker, List., etc., p. 486.

Hybos triplex Walker, List, etc., p. 486.

Hybos subjectus Walker, List, etc., p. 487.

Euhybos Coquillett, Proc. Nat. Mus., 1895, p. 437.

As this genus contains some of the most variable of flies, it is not strange that with the limited material at his disposal Mr. Walker should erect four species on what is now given as a single form. The unusually rich collection of this species shows variations in color to every degree; hence, even the Mexican varieties which are to some extent distinct had better be dropped as varietal names. In establishing these forms it was not the intention to erect mere catalogue names, but to give convenience in handling the collections.

The name *triplex* is chosen, as it has been used more than the others for this species.

The genus *Euhybos* Coquillett, established on Walker's species, has been rejected because its characters are shared in varying part by the Mexican species.

Head: occiput finely dusted, finely pubescent. Eyes brownish, contiguous above and below the antennæ. Antennæ black, third joint oval to subulate, blunt at the tip or gradually passing into the arista. Mouth parts inconspicuous.

Thorax black, shining, with long or short, rather dense to moderate, white to black, or mixed white and black hair. Pleuræ glabrous. Scutellum with two bristles.

Abdomen black, shining, except the hypopygium and the last two segments of the female, with sparse or bushy whitish hairs, denser on the sides of the segments basally. Hypopygium with denser and shorter hairs, small; the valves vary in length, the ventral process may be minute or in the lengthened hypopygium elongate.

Legs wholly black, except the pulvilli, or more or less yellowish, with bristle-like and ordinary, whitish to dusky hairs. Hind femora piceous to shining black, variable in length and thickness, black-spinose below. Front and middle legs slender. Hind tibiæ bowed, without bristles, piceous to black. Front and middle tibiæ piceous to black, with bristles. Knees sometimes yellowish. Metatarsi often yellow. Tarsi variable in amount of yellow color, always dark at the tip, with several long, slender bristles, except on the hind pair.

Wings almost clear hyaline to brown, except the apical third or less. Stigmal spot brown or absent. Halteres fuscous. 2.5-5 mm.

This description of an insect which may well share with the bee-tle *Nodonta* (*Colaspis*) *tristis*, the distinction of being the most protean of insects, is drawn from an examination of over a hundred specimens. These flies were collected throughout the eastern half of North America. The localities represented are Massachusetts, Pennsylvania, Maryland, North Carolina, Georgia, Alabama, Ohio, Ontario, Michigan, Indiana, Illinois, Wisconsin, Colorado, Texas, Vera Cruz, Tabasco and Yucatan.

Hybos sequens nom. nov.

Hybos dimidiata Bellardi, Mem. della Reale Acad. delle Scienze di Torino, Ser. ii, vol. xxi, p. 197.

Female.—Brownish black. Head moderate; antennæ black; proboscis yellow; occiput black. Thorax strongly convex, brownish black, with dense and short fuscous tomentum; humeri pale; pleuræ and pectus pale fuscous; scutellum brownish black, concolorous with the thorax; halteres pale at the base, subfuscous apically. Abdomen brownish black, side margins pale; venter black, pale at the sides; ovipositor long, acute, black. Legs honey-yellow, with black spines; posterior femora much thickened, long. Wings strongly fuscous at base, apically subhyaline; first posterior cell much narrowed at the margin of the wing; stigma elongate, fuscous. 5 mm.

Mexico (Salle).

Among the Empidæ to be worked over for the Biologia Centrali Americana of Messrs. Godman and Salvin were two species, both undescribed, taken in Chapada, Brazil. One of these, the subject of this note, is a peculiar Hybotine, which can not be classed with any of the known genera. This fly, though clearly belonging to

the subfamily Hybotinæ, presents a habitus much different from that of any of the other members of the group. Both in color and structure it departs from its nearest relative *Hybos* Fabricius, from which it may be distinguished by the uniformly brown wings, the narrowed first posterior cell, the greatly thickened legs, the smaller number of bristles, the stouter abdomen, the large hypopygium, etc.

From *Scelobates* Philippi* this form may be separated by the two-jointed antennæ, longer anal cell, stouter abdomen, shorter and stronger legs, etc.

From *Harpamerus* Bigot† (Ceylon) a close relative apparently; it is generically distinct, in that the spines of the underside of the hind femora arise from the apices of strong tubercles instead of being merely incrassate towards the base. The anal cell seems to be longer, and the whole wing different.

LACTISTOMYIA gen. nov.

Robust; thorax and abdomen densely covered with fine reddish brown tomentum. Antennæ very short, two-jointed, the outer joint elongate-oval, slightly longer than the inner joint, with a slender terminal bristle over four times the length of the antenna. Proboscis slender, projecting forwards, two thirds the height of the head. Palpi slender, parallel with and shorter than the proboscis. Eyes bare, rufous, contiguous from the antennæ to the three ocelli, the upper half consisting of larger ommatidia than the lower. Postocular bristles minute. Thorax globose, very prominent, with no bristles, but with scattered, fine, reddish pubescence, longer at the sides, and almost bristle-like at the margin of the scutellum. Abdomen robust, cylindrical, deflexed at the tip, twice the length of the thorax, with fine pale hairs along the sides of the segments, longer than those of the thorax. Hypopygium large, deformed, flexed to the right, consisting of a large, very convex, dorsal piece, produced at the right distal corner, and with a marginal fringe of small bristles, and a lengthened, transversely convex, ventral valve, irregularly produced and twisted to the left of the upper projection; between the two arises the thin compressed, semi-translucent, hastate penis. Legs short, robust, front and middle legs simple, though stout, hind legs remarkably thickened, strongly tuberculate

* Verh. d. k. k. zool. bot. Ges., Band xv (1865), p. 751.

† Revue et Mag. de Zool., No. 7 (1859).

and spiny below, and bristly above; hind tibiæ glabrous, bent at proximal fourth and from thence uniformly curved, sharp on inner edge, rounded on the outer, the side faces flat. Middle tibiæ on the outer edge with three bristles; remaining hairs of the legs finer, denser on the front and middle legs, though nowhere long. Wings broad, rather pointed at the tip, anal angle prominent, rounded, almost rectangular; veins strong; first posterior cell much narrowed in the margin; discal cell long and narrow; outer section of the fifth vein equal to the posterior cross vein; outer section of the sixth vein shorter than the anal cross-vein.

Lactistomyia insolita sp. nov. (Fig. 82).

Male.—Length 5.5 mm., length of wing 4.5 mm. Robust, piceous, with a greenish tinge. Antennæ piceous, exceedingly short, the arista a little shorter than the eye height. Palpi and proboscis fuscous; proboscis one-fourth shorter than the head. Eyes narrowly separated on the face. Thorax with golden pubescence and brownish dust. Tegulæ and halteres infuscated, the former with short yellow cilia. Abdomen dark olive green, pilose along the sides, twice the length of the thorax; hypopygium large, reflexed, concolorous, except the lighter metallic, fuscous distal portion, its sutures fringed with hair, the left side with a larger, inverted, the right side with a smaller, bowl-shaped piece. Legs short, stout, fuscous, shining, especially the hind legs, metallic by certain reflections; coxæ concolorous with the legs; anterior and middle femora, tibiæ and tarsi all of about the same length; posterior coxæ globose, swollen on the inner side; posterior femora not surpassing the abdomen in length, enormously thickened, sparsely hairy, on inner side bounding a narrow, smooth, shining space, with two rows of tubercles, about eleven in the anterior row and seven in the posterior, each tubercle provided with a stout spine; hind tibiæ stout, one-third less than the length of the femora, strongly incurved, without spines, but with an external row of short hairs; hind tarsi short, one-half the length of the others, the first joint one-third longer than the remainder of the tarsus. Wings strongly infuscated, of the same general color of the rest of the insect, no darker stigma; rather pointed; veins strong, third and fourth longitudinal veins convergent, ending symmetrically at the tip of the wing; discal cell narrow; anal angle fully developed, anal vein strongest at the tip, though poorly marked.

A single male specimen. Chapada, Brazil. A very curious insect.

SYNECHES Walker.*

Small, generally brownish species. Antennæ shorter than the head, apparently two-jointed, terminal joint rounded with a long end-bristle. Proboscis short, palpi rather long. Eyes bare, con-

* Almost the only note on the manner of feeding of American Empididæ is to be found in the Proceedings of the Washington Entomological Society, 1891, p. 146. There Mr. Schwarz describes the feeding habits of a species of *Syneches*:

tiguous in both sexes. Thorax large, hunchbacked, abdomen long, small at tip. Hind femora long, incrassate, with setulæ beneath. Wings generally spotted, second vein bowed towards the costa, third vein simple, discal cell present, with two veins at its tip; anal cell as long as the second basal, nearly truncate at its tip, anal angle rectangular.

Wings unspotted, or marked with only one spot.....2.

Wings with a black spot beyond the apex of the first vein and another at the apex of the second vein; marginal cell at tip of first vein twice as wide as the submarginal cell at that point.....**simplex** Walker.

2. Legs partly or wholly yellowish3.

Legs wholly black, thorax marked with a white pollinose humeral spot, and with a similar one in front of the scutellum; stigma brownish.

albonotatus Loew.

3. Wings marked with a brown stigmal spot4.

Wings with a pale gray stigmal spot, femora wholly yellow.

hyalinus Coquillett.

Wings unspotted, knob of halteres and the entire body black.

pusillus Loew.

4. Marginal cell at apex of first vein twice as wide as the submarginal cell at the same point; knob of halteres whitish.....5.

Marginal cell not widened.....6.

5. Thorax wholly yellowish**rufus** Loew.

Thorax marked with three black vittæ, or wholly blackish.

thoracicus Say.

6. Knob of halteres black**debilis** Coquillett.

Knob of halteres brown.....**quadrangularis** Wheeler et Melander.

Syneches albonotatus Loew.

Cent., ii, 18.

Black, opaque, thorax marked with white pollinose shoulder-spots and one before the scutellum. Abdomen with fuscous pollen. Legs black, shining, tarsi piceous, black towards apex. Wings dark cinereous, veins black, stigma subobsolete, pale fuscous. 3.5 mm.

District of Columbia (Osten Sacken).

Syneches hyalinus Coquillett.

Proc. Nat. Mus., 1895, p. 437.

Opaque, black, base of the abdomen yellowish; antennæ and knob of halteres

"During daytime these flies rest on the under side of leaves, etc., in the shadiest parts of the woods. Toward evening they fly about in the more open places and capture minute Diptera. Holding their prey between the legs, and their body being in a vertical position, they slowly fly toward the nearest bush, and, without alighting, most dexterously manage to take hold of the edge of a leaf with the claws of a front leg. Thus vertically suspended by a single leg, the fly uses its five free legs for manipulating the gnat. Within ten seconds it has sucked out its prey, then drops the same and flies away."

yellowish brown; proboscis and legs yellow; coxæ, trochanters and tips of tarsi black; wings hyaline; stigma pale grayish; marginal cell at tip of first vein nearly twice as wide as the submarginal cell at that point. 5 mm.

Maryland (Coquillett).

Syneches pusillus Loew.

Cent., i, 25.

Small, opaque, dark fuscous. Proboscis yellow. Antennæ dark fuscous. Abdomen black, opaque, posterior margins of the segments narrowly cinereous pollinose. Legs pale yellow, varied with fuscous, in the lighter specimens the basal half of all the femora, the apex of the posterior femora, a subapical ring on the posterior tibiæ, a middle ring and the last joint of the posterior tarsi fuscous in color; in the darker specimens these markings are more diffused and nearly black. Halteres dark fuscous, the pedicel lighter. Wings cinerascens immaculate.

Illinois; New York: St. Vincent, W. I.; Wisconsin; Kansas; New Mexico.

Syneches debilis Coquillett.

Proc. Nat. Mus., 1895, p. 436.

Antennæ black, proboscis and palpi yellow. Thorax yellow, marked with three vittæ and a lateral spot of yellowish brown. Abdomen and knob of halteres black. Legs yellow, the last tarsal joints, apices of hind femora, middle of hind tibiæ and of their first tarsal joints black. Wings grayish hyaline, stigma pale smoky brown, marginal cell at tip of first vein not wider than the submarginal cell at the same point. 3.5 mm.

District of Columbia; Maryland; Georgia.

Syneches quadrangularis Wheeler et Melander (Fig. 85).

Biol. Cent. Am., 1901, Dipt. Suppl., p. 374.

Fuscous. Antennæ fuscous. Mouth parts yellowish. Mesonotum fuscous, with faint indications of the lighter vittæ, slightly tomentose. Halteres fuscous, the pedicel lighter. Abdomen dark brown; hypopygium small. Legs, including coxæ, yellow; of the hind pair the femora, tibiæ and metatarsi are apically brown. Wings hyaline, with a single, well-limited, quadrate, dark brown stigmal spot at the apex of the first longitudinal vein; marginal cell not widened at the stigma; third vein not rigidly straight, veins brown. 2.5 mm.

Tabasco, Mexico.

Syneches rufus Loew.

Cent., i, 24.

Rufous, opaque; antennæ, proboscis, palpi, halteres and legs concolorous; the posterior tibiæ often and the anterior and posterior femora sometimes fuscous. Color of the abdomen tending towards fuscous. Wings subhyaline, costal cell lutescent, second longitudinal vein meets the costa obliquely; beyond the end of the first vein there is a black rounded spot. 4 mm.

Illinois; New York; Ohio; Indiana; Wisconsin.

Syneches thoracicus Say (Fig. 84).

Hybos thoracicus Say, Compl. Writ., ii, p. 68.

Antennæ and rostrum yellow, pale; thorax ferruginous, with three dilated black lines; wings obscure, a dark red-brown stigma; feet reddish brown, the posterior pair darker than the others, tarsi yellowish; abdomen dull piceous. Rather more than one-fifth of an inch.

Pennsylvania, Maryland, Virginia, North Carolina, Kentucky, Ohio, Illinois, Kansas.

Syneches simplex Walker (Fig. 86).

Insecta Saundersiana. Dipt., p. 165.

Body dark brown, clothed with black hairs; eyes red, meeting above; facets large; mouth and feelers tawny; bristles of the feelers black; chest adorned with tawny stripes which are nearly confluent; abdomen linear, rather flat, black, longer and much narrower than the chest; tip dark tawny, shining; legs tawny; thighs and fore shanks partly pitchy; wings pale gray, brownish on the borders of the cross-veins and beneath the brand, which is dark brown; the wing is yellow on each side of the latter, and there is a dark brown spot beyond it; wing-ribs and veins brown; poisers large, tawny. 3 mm.

"United States."

Massachusetts, North Carolina, Georgia, Ohio, Ontario, Michigan, Indiana, Illinois, Wisconsin.

SYNDYAS Loew.

Small black species, differing from *Syneches* and *Hybos* in that the first section of the fourth vein is almost indistinct, and that the origin of the second vein is still more distant from the base of the wing.

Only the following species are known from North America.

Dorsum of abdomen opaque.....**dorsalis** Loew.

Abdomen bronzed black.....**polita** Loew.

Syndyas dorsalis Loew.

Cent., i, 26.

Wholly black, shining, the back of the abdomen opaque, clothed with fuscous tomentum. Thorax with very short hairs, abdomen with longer whitish hairs; bristles of thorax and scutellum black. Legs black-pilose, posterior tibiæ thick, clavate, and posterior metatarsi strongly incrassate. Halteres black. Wings hyaline, veins pale fuscous, second half of the costa blackish. 3.3 mm.

New York: Illinois.

Syndyas polita Loew (Fig. 83).

Cent., i, 27.

Wholly black, shining. Dorsum of thorax with very short pile, abdomen with longer, dirty white pile; thoracic and scutellar bristles black. Legs black-pilose, posterior tibiæ thick, moderately clavate, posterior metatarsi moderately incrassate.

sate. Wings hyaline, subcinerascens, the outer half of the marginal cell distinctly cinerascens, veins dark fuscous, apical part of the costa black. 3.3 mm.

Carolina: Massachusetts, Georgia, Alabama, Louisiana, Kansas, Ohio, Michigan.

MEGHYPERUS Loew.

Small black species. Antennæ short, apparently two-jointed. Bristle terminal, thickly pubescent. Proboscis very short. Eyes bare, males holoptic, females broadly dichoptic. Thorax large. Legs rather short, wholly glabrous, hind tibiæ somewhat broadened, metatarsi of all the legs lengthened. Wings unspotted, third vein simple, fourth vein forked; discal cell present, with two apical veins. Third antennal joint twice as long as broad; abdomen shining.

nitidus sp. nov.

Third antennal joint but little longer than wide; abdomen opaque, velvety black.

occidens Coquillett.

Meghyperus occidens Coquillett.

Proc. Nat. Mus., 1895, p. 435.

Black, including antennæ, proboscis, palpi, halteres and legs; third antennal joint conical, slightly longer than wide, the arista two-thirds the length of the third joint. Thorax lightly gray pollinose; scutellum with six black bristles. Abdomen opaque velvet black; hypopygium small, porrect, slightly longer than the seventh segment. Legs rather robust; upper side of the hind femora with a fringe of white hairs, hind femora somewhat broader than any of the others, hind tibiæ greatly dilated; hind metatarsi nearly twice as thick as any of the others. Wings hyaline, stigma and veins brown, anal cell nearly as long as the second basal. 2-3 mm.

Southern California.

Meghyperus nitidus sp. nov. (Fig. 72, 73).

Length 2.5 mm.—Black over all, shining. Eyes of the male contiguous, of the female widely distant. Vertex of the female shining. Antennæ stout, third joint triangular, twice as long as broad, its arista equal to the greatest width of the joint, stout. Proboscis directed forward in the male specimen, downward in the females, nearly as long as the head-height. Thorax with pale yellow bristles, the acrostichals and dorsal rows distinct, scutellum with six pale bristles. Thorax lightly dusted on pleuræ and coxæ. Abdomen shining above and below, with scattered pale hairs. Legs with short pale hairs, but with no bristles, front femora moderately stout, the other femora less thickened; hind tibiæ gradually clavate, compressed; metatarsi about equalling the next three joints, not enlarged. Halteres black, pedicel slender, knob large. Wings clear hyaline, nerves yellowish, an infumated stigmal spot present, anal cell equalling the basals in length, anal angle rectangular.

Three specimens; Moscow, Idaho, June 17, 1895, Prof. J. M. Aldrich collector.

The tips of the abdomen of all three specimens are eaten by parasites, therefore nothing can be stated about the sexual characters.

OEDALEA Meigen.

Small, slender, almost glabrous species of shining black color. Antennæ long, plainly three jointed, the first two joints short, the third lengthened, with a short, rather stout, two-jointed arista. Proboscis shorter than the head. Eyes of male contiguous, of female separated. Thorax prominent; abdomen long and slender; hypopygium small. Legs slender, except the thickened and lengthened hind femora, which are spiny beneath; the hind tibiæ are bowed, shorter than the femora. Wings with simple third vein; discal cell present, apically with three veins; anal cell (in our species) truncate; anal angle well developed, rectangular.

Oedalea ohioensis sp. nov. (Figs. 74, 75, 76).

Male. Length 3 mm.—Body black, shining. Occiput shining black. Eyes large, brownish red, facets small, eyes contiguous above antennæ. Face shining black, not broad, the sides parallel. Antennæ broken beyond the first joint which is piceous. Proboscis fusco-piceous, haustellate, equalling one-third the eye height; palpi not visible in this specimen. Thorax large, very shining, sparsely covered with pale short hairs, no bristles, except two small prealar and six piceous scutellar ones. Abdomen less shining, cylindrical, slender, a little longer than the head and thorax together, sparsely covered with short dusky hairs; hypopygium small, pointed, with a short thick dorsal process which is bent to the right. Coxæ, front and middle legs and hind femora pale testaceous, the hind tibiæ, except basal fourth, piceous; hind tarsi fuscous; front and middle legs plain, slender, hind femora thickened, reaching to the end of the abdomen, provided with a fringe of long pale hairs, beneath on the outer half with a double row of small black teeth; hind tibiæ two-thirds the length of the femur, at basal fourth geniculate. Halteres pale fuscous. Wings lightly infumated, stigma dark, all the discoidal veins reaching the margin, veins strong, dark fuscous, except the vein between the two basals, anal cross-vein perpendicular to the anal vein which is attenuate, but reaches the margin, anal cell shorter than the second basal cell, anal angle well developed, rectangular.

A single male, collected at Vinton, Ohio, by Prof. James Hine in the early part of June, 1900. This is the first reported occurrence of this genus upon this continent.

EUTHYNEURA Macquart.

Small, sparsely hairy shining species. Antennæ shorter than the head, in our species apparently two-jointed, the outer joint sublanceolate and with a very short arista. Proboscis in the American species not longer than the head. Eyes of the male contiguous, of the female separated. Thorax large. Legs rather long, the hind metatarsi slightly thickened, hairs of legs short. Third longitudinal vein

of the wings simple; discal cell emitting three posterior veins; anal vein (at least in our species) distinct beyond the anal cell.

Notwithstanding the fact that I have at hand no specimens of Mr. Coquillett's species, added to the superficial character of his descriptions, yet, without great hesitation, I have placed his species in this European genus.

Black, the legs largely yellow **flavipilosa** Coquillett.
 Yellow, a median vitta brown.....**crocata** Coquillett.

Euthyneura flavipilosa Coquillett.

Microphorus flavipilosus Coq., Proc. Wash. Acad. Sci., 1900, p. 413.

Male.—Black; the hairs, stems of halteres, femora and tibiæ, yellow, knobs of halteres and the tarsi brown; eyes of male contiguous, third joint of antennæ sub lanceolate, only slightly tapering to the apex, over four times as long as the style, proboscis noticeably shorter than height of head, mesonotum highly polished, scutellum bearing about ten marginal bristles, abdomen slightly polished, hairs of legs sparse and rather short, first joint of hind tarsi slightly thicker than that of any of the others; wings hyaline, stigma smoky brown, veins yellowish brown, last section of fifth vein one-fourth as long as the preceding section, sixth vein reaching almost to the wing margin. 2 mm.

British Columbia.

Euthyneura crocata Coquillett.

Microphorus crocatus Coq., Proc. Wash. Acad. Sci., 1900, p. 413.

Female. Yellow, the head and its members, a median vitta on mesonotum, dorsum of abdomen and apices of tarsi dark brown, third joint of antennæ sub lanceolate, only slightly tapering to the apex, about twice as long as wide, five times as long as the style; proboscis about as long as height of head; hairs of body sparse and rather short, yellow; mesonotum polished, scutellum bearing about eight bristles, abdomen polished; hairs of legs very short, first joint of hind tarsi slightly thicker than that of any of the other tarsi; wings hyaline, veins yellowish brown, stigma almost obsolete, last section of fifth vein nearly half as long as the preceding section, sixth vein ending a short distance from the wing margin. 2 mm.

Alaska.

LEPTOPEZA Macquart.

Rather small, almost glabrous species of shining black or reddish color, with very slender abdomen. Antennæ shorter than the head, three jointed, the third joint elongate-oval, with a long terminal bristle. Otherwise as in *Ocydromia*. There is indication of a vein arising from the front of the discal cell and extending towards the margin.

Black; wings light brown **flavipes** Meigen.
 Wings hyaline.....2.

2. Posterior femora brown; antennæ short; hypopygium open.

disparilis sp. nov.

Femora yellow; antennæ longer; hypopygium comparatively closed.

compta Coquillett.

Leptopeza flavipes Meigen (Fig. 68).

Syst. Besch., ii, 353.

Shining black, antennæ piceous, palpi yellow. Legs yellow, with brown tarsi, of the hind legs the coxæ, tips of the femora and the tibiæ brown; halteres yellow. Wings brownish. 4 mm.

Europe and North America.

One male; Dixie's Landing, Virginia. The wings are tinged with brown and the halteres are infuscated. The antennæ are much lengthened. The abdomen is piceous, with the apical margins of the segments black. The hypopygium is devoid of long hairs and is closed, its parts not so distinctly visible.

Leptopeza disparilis sp. nov. (Fig. 69).

Male. Length 4.5 mm.—Shining black. Antennæ black, a little shorter than the arista, third joint elongate, conical; antennæ one-fourth the head-height. Palpi and proboscis blackish brown. Postocular bristles black, cilia whitish. Thorax and abdomen with yellowish hairs and bristles. Hypopygium terminal, its parts distinct, filaments exposed, curved on the right side, straight on the left side, lower cleft shorter than the upper. Hind coxæ brownish, fore and middle coxæ, femora and tibiæ yellow, tarsi dusky from first joint, posterior femora and tibiæ brown, the tibiæ and metatarsi swollen, middle tibiæ with a series of three (four) long bristles on the outer side. Halteres light yellow. Wings hyaline, veins rather strong fuscous, no stigmal darkening.

Five males; California, Idaho.

This species is larger and more robust than the others.

Leptopeza compta Coquillett (Fig. 70).

Proc. Nat. Mus., 1895, p. 435.

Head black, gray pollinose, eyes contiguous; antennæ yellow, third joint elongate oval, twice as long as broad, the arista black and nearly as long as the antenna; proboscis and palpi yellow, proboscis less than one-third as long as the height of the head. Thorax, pleuræ, scutellum and metanotum yellow. Abdomen blackish brown, the first segment, narrow lateral margins and front margin of each segment yellow; venter yellow. Legs slender, light yellow, including the coxæ. Halteres light yellow. Wings grayish hyaline, stigma wanting. 4 mm.

New Hampshire, Massachusetts.

Numerous specimens of both sexes in the collection from Ohio, Tennessee, Illinois, Wisconsin and Idaho. The color varies from completely yellow, except the head and three basal spots on the abdomen black, to completely black, except the venter, coxæ and

legs rufous in the female, and venter, hind tibiæ and tarsi black also in the male. There is a complete gradation in specimens from a single locality.

OXYDROMIA Meigen.

Rather small, slender, almost glabrous species of black or reddish color. Antennæ shorter than the head, three jointed, the third joint oval, with an almost terminal, dorsal bristle. Proboscis short; palpi small, bare. Eyes glabrous, contiguous in the male, subcontiguous in the female. Thorax prominent; abdomen lengthened, femora and tibiæ simple. Wings with a simple third vein; a discal cell present, emitting two, and often a rudiment of a third, veins to the wing margin. Anal cell shorter than the second basal. Anal angle oblique, rounded.

Oxydromia glabricula Fallen (Figs. 66, 67).

Oxydromia glabricula Fallen, Empididæ, 33, 42 (1816).

Oxydromia perigrinata Walk., List, etc., iii, 488.

This species, which offers about a half dozen color varieties in Europe, is present in the United States as the following variety, described from ten specimens collected in widely distant localities:

Very shining; black above, more or less reddish below. Mouth parts and antennæ black. Occiput less shining than the thoracic dorsum. Margin of the scutellum, the humeri, pleuræ, coxæ and the ventral incisures of the abdomen more or less reddish. Legs yellowish red, more or less fuscous above, at the apices of the tibiæ and on the tarsi. Halteres fuscous. Wings hyaline, more or less infumated. Veins fuscous, somewhat reddish at the base. Anal vein almost reaching the wing margin, the cross-vein nearly perpendicular to it. Outer anterior bend of the discal cell with the fourth vein faint. Legs hairy, the hairs a little denser on the inner apical third of the male hind tibiæ; scutellum with two apical bristles; dorsum of the thorax almost glabrous; abdomen subglabrous; hypopygium black, small, with a few hairs. 5 mm.

Wisconsin, Wyoming, Vancouver Island. Ten specimens.

BRACHYSTOMA Meigen.

Almost glabrous species of brown-black color. Antennæ three-jointed, diverging. Proboscis shorter than the head, thick, vertical. Eyes of both sexes separated, but approaching beneath the antennæ in the male. Thorax large; abdomen slender, lengthened, in the male the genitalia are somewhat exposed, in the female the abdomen ends in a large, semi-transparent, bladder like, peculiar organ, in the lower side of which the ovipositor is enclosed. Wings

with a forked third vein; discal cell present, emitting three veins to the margin; anal cell longer than the second basal; anal angle gone.

Antennæ yellow, third joint brown; abdomen yellow, with dorsal dark spots.

robertsonii Coquillett.

Antennæ piceous; abdomen dark fuscous.....**occidentalis** sp. nov.

Brachystoma robertsonii Coquillett.

Proc. Nat. Mus., 1895, p. 393.

Head black, gray pollinose; face naked, scarcely half as wide as the front; antennæ yellow, the third joint, except at the base and style, brown; the third joint lanceolate, scarcely twice as long as broad, twice as long as the second; style curved, one-third longer than the third joint; proboscis yellow, palpi whitish. Thorax very shining black; pleura blackish, opaque light gray pollinose; metanotum and scutellum the same, the latter bearing two bristles. Abdomen compressed, shining, yellowish, a large dorsal black spot on each segment; hypopygium large, ascending, each upper lamella produced at the outer angles into a pair of long, erect, cylindrical, brown processes; middle lamellæ very large, each bearing at its tip a rather large curved process, in front of which is a small pilose tubercle, while behind it is a smaller tubercle bearing a few long whitish bristles; the inner side of each lamella bears a long, cylindrical, brown-tipped process; filament slender, arcuate, proceeding from apex of the rather large lower lamella. Legs including the coxæ yellow; front and hind femora slender, the middle nearly twice as thick as the front ones, their upper side thickly beset with very short black spines and with longer black bristles; inner side of middle tibiæ also thickly beset with very short black spines. Halteres yellow. Wings nearly hyaline, stigma wanting, first basal cell slightly longer than the anal, which is a trifle longer than the second basal. 4 mm.

Illinois, Tennessee, Ohio.

Brachystoma occidentalis sp. nov. (Fig. 89).

Male and Female. Length 4 mm.—Head and thorax black, abdomen fuscous. Face extremely narrow, gray (female), obliterated in the male; front moderately narrow, black; vertex and occiput shining. Antennæ equal to head, piceous, third joint subequal to first one, arista white, equalling antenna. Palpi white, proboscis yellow. Thorax shining, humeral callosity more or less fuscous; a prealar but no scutellar long bristles; pleuræ a little dusted with gray; halteres yellowish. Abdomen twice as long as thorax, fusco-piceous; of the female compressed in all the (dried) specimens, but the terminal segment greatly enlarged, balloon-like. The enlargement is sometimes translucent yellow bronzed. Abdomen of the male yellowish at the base, black apically, the hypopygium small, terminal, the upper lamellæ small, elongate, slender, the outer extremity filiform, the middle lamellæ moderate in size, the outer side excised, from the emargination of which arises a slender filiform appendage, the central filament slender, its base moderately thickened, strongly arcuate, and suddenly recurved near the tip. Legs slender, yellow, upper side of four posterior femora, all tibiæ and tarsi brownish; no setulæ present. Wings uniformly lightly infumated, veins fuscous, third vein forked, submarginal cell not closed, basal cells equal, anal cell a little longer, its cross-vein curved, no anal angle.

Numerous specimens; Washington, Idaho (J. M. Aldrich).

BLEPHAROPROCTA Loew.

Insects resembling *Brachystoma* in everything but the noninflation of the abdomen and the neuration of the wing. In this genus the first submarginal cell is squarely cut off by a cross-vein connecting the second and the third longitudinal veins.

The three basal cells subequal.....2.

Second basal and anal cells long.....**binummus** Loew.

2. Base of anterior tarsi fuscous, of middle tarsi badius.....**serratula** Loew.

Anterior and middle tarsi black.....**nigrimana** Loew.

Blepharoprocta nigrimana Loew.

Cent. ii, 17.

Head black, shining. Antennæ black. Face very narrow, white-pollinose. Proboscis pale yellow. Thorax black, shining, bare, the lower half of the pleuræ white-pollinose. Scutellum and abdomen black; venter yellow. Hypopygium subglobose, black, apically with some erect pile pale yellowish. Coxæ and legs slender, yellowish. Anterior femora below near the apex with small black spines; middle femora not thicker than the others, pure yellow; posterior femora fuscous, except the base and very apex. Anterior tibiæ increasing in yellow color towards the apex, posterior fuscous, pale below near the apex. Anterior tarsi black, posterior dark fuscous, black at tip. Wings cinerascens, narrow, stigma obsolete, hairs of the hind margin not bent back; first submarginal cell closed; the three basal cells subequal. 2.7 mm.

Illinois (Le Baron).

Blepharoprocta binummus Loew (Figs. 91, 92).

Cent. ii, 16.

Head black, shining. First two joints of the antennæ pale yellowish, third joint black, the terminal seta black. Face very narrow, white-pollinose. Proboscis pale yellow. Thorax black, shining, bare, hind angles dark fuscous, lower half of the pleuræ white-pollinose. Scutellum black; abdomen black, shining, bare; venter yellowish; hypopygium globose, black, apically provided with a bundle of pale yellow hairs. Coxæ and legs slender, pale yellow. Anterior femora below near the apex with very small black spines; middle femora a little thicker than the others, curved, below near the base with rather sparse white hairs, behind—before the apex—with very closely-placed hairs; hind femora more slender on the outer half, infuscated. Anterior tibiæ simple, basal half of the middle tibiæ subfuscous, at the apex suddenly thickened and provided with long pale yellowish hairs; posterior tibiæ curved, fuscous, the extreme apex paler. The first three joints of the front tarsi decreasing in length, yellow, the last two black, dilated, on both sides short black-pilose, each with a silvery dot below, the outer one larger; of the middle tarsi the first three joints are yellow, the last two black; the hind tarsi have the last joint black, the next to the last dark fuscous, and the others yellow. Halteres white. Wings long, narrow, wedge-shaped, subcinerascens, stigma obsolete, posterior margin with long reflexed hairs in part; first submarginal cell closed; the two anterior basal cells much shorter than the anal. 3 mm.

District of Columbia.

Blepharoprocta serratula Loew (Fig. 90).

Cent. i, 23.

Female.—Head black, shining. Face very narrow, white-pollinose. Proboscis yellow. Thorax and scutellum black, shining, pleuræ sparsely white-pollinose. Abdomen lengthened, cylindrical, dark dull yellow, base and apex darker; venter luteous; last abdominal segment whole, not inflated, the upper and lower parts connate, the posterior margin provided with numerous white hairs. Coxæ and legs pale yellow, an anterior spot on the posterior femora, and almost the whole of the hind tarsi badius, last two joints of the tarsi piceous, the preceding joints of the anterior tarsi fuscous, of the middle badius; posterior femora unarmed, front femora near the tip below with very small spines. Halteres yellow. Wings very narrow towards the base, yellowish cinerascens, veins strong, yellowish fuscous; first submarginal cell closed. 3.3 mm.

Georgia (Gerhard).

EMPIDINÆ.**HILARA** Meigen.

Rather large to small species of gray, black, or rarely reddish color. Antennæ as long as the head or longer, three jointed, the third joint fusiform, compressed, with a two-jointed arista. Proboscis not longer than the head. Eyes of both sexes separated. Humeri prominent. Legs bare or bristly, the front metatarsi of the male nearly always much thickened. Wings with a forked third vein, the upper branch of which is not perpendicular to the remainder; discal cell with three veins issuing from its apex; anal cell shorter than the second basal, both bounded by a cross vein almost parallel with the hind margin; anal angle prominent.

The following artificial key contains all the species from North America, with the exception of Walker's three. In the collection are representatives of about a half dozen other species, but as most of them are species of poor characterization, it was deemed best to await more material.

- Thorax green.....**viridis** Coquillett.
 Thorax reddish yellow2.
 Thorax black or gray.....3.
 2. Tarsi wholly brown, pile on inner side of middle tibiæ long.
 testacea Loew.
 Tarsi brown only at apex, elsewhere yellow, pile of inner side of middle
 tibiæ short.....**lutea** Loew.
 3. Front femora thickened; stigma weak.....**femorata** Loew.
 Front femora not thickened.....4.
 4. Thorax posteriorly with golden pubescence.....**aurata** Coquillett.
 Thorax otherwise.....5.
 5. Antennæ reddish at base.....**umbrosa** Loew.
 Antennæ black.....6.

6. Abdomen yellowish at base.....**basalis** Loew.
Abdomen unicolorous, dark7.
7. Stigma obsolete.....8.
Stigma at least fuscous.....12.
8. Legs fuscous to black9.
Legs paler11.
9. Thorax 4-vittate**quadrivittata** Meigen.
Thorax evittate10.
10. Thoracic hairs blackish; halteres whitish; veins pale..**leucoptera** Loew.
Thoracic hairs pale; halteres infuscated; veins dark.....**bella** sp. nov.
11. Abdomen opaque.....**macroptera** Loew.
Abdomen shining.....**congregaria** sp. nov.
12. Front metatarsi not thickened; antennæ at least three times as long as the
head, its style twisted**johnsoni** Coquillett.
Male front metatarsi somewhat thickened; antennæ shorter, the style
straight13.
13. Palpi black.....14.
Palpi testaceous23.
14. Knees more or less yellowish.....15.
Knees black.....18.
15. Wings blackish.....**tristis** Loew.
Wings cinereous.....16.
16. Knob of halteres black.....**mutabilis** Loew.
Knob of halteres fuscous.....17.
17. Thorax vittate**trivittata** Loew.
Thorax evittate.....**nugax** sp. nov.
18. Thorax vittate19.
Thorax evittate20.
19. Pile of abdomen yellow**cana** Coquillett.
Pile of abdomen black**baculifer** sp. nov.
20. Abdomen opaque.....**unicolor** Loew.
Abdomen somewhat shining.....21.
21. Wings dusky**velutina** Loew.
Wings subcinereous.....22.
22. Thorax shining**atra** Loew.
Thorax velutinous**carbonaria** sp. nov.
23. Abdomen at base fuscous.....**basalis** Loew.
Abdomen wholly black24.
24. Femora, except tip, black; thorax with two obsolete vittæ.
brevipila Loew.
Femora more or less yellow; thorax evittate.....25.
25. Knob of halteres black26.
Knob of halteres yellowish.....27.
26. All the femora testaceous.....**gracilis** Loew.
The hind femora not testaceous**nigriventris** Loew.
27. Pile of middle tibiæ long**seriata** Loew.
No long hairs on middle legs; second joint of front tarsi of the male not pro-
ceeding from the tip of the metatarsus.....**Wheeleri** Melander.

***Hilara quadrivittata* Meigen.**

Syst. Besch., iii, p. 7.

Black, thorax cinereous, with four fuscous vittæ; halteres white; front metatarsi of the male thick, oblong. Head cinereous. The outer thoracic vittæ abbreviated in front. Abdomen and legs black. Wings hyaline, with a brownish margin, at the tip a little darkened. Abdomen of the male piceous, the hypopygium globose, reaching back on the dorsum of the abdomen. Tibiæ bristly. 4 mm.

Europe, Alaska (Kincaid).

***Hilara umbrosa* Loew.**

Cent. ii, 34.

Head black, cinerascens, with whitish pollen, except for the front. The first two joints of the antennæ reddish, fuscous above, the third black. Palpi fusco-testaceous. Dorsum of the thorax subcinerascens, the pollen sparse, closely black-pilose. Abdomen concolorous with the thorax, with short black pile. Coxæ and legs pale testaceous, the posterior tibiæ and all the tarsi dark grayish. Wings cinereous, darker in the outer half, stigma blackish. 4.6 mm.

Illinois (Le Baron).

One male; Wood's Holl, Massachusetts, is probably the same as Loew's species. It is characterized thus:

Vertex opaque black, face cinereous; proboscis as long as the head, labella extending to the tip of the proboscis; palpi directed forwards, fuscous, with long hairs below. Thorax with a few short hairs, serially arranged and parted outwardly from the middle; scutellum with six long and several more short bristles. Hypopygium pedunculate, compressed, black, lamellæ widely opened, filament long, slender, extending forward, entirely visible, apically fuscous. Legs rather stout, luteo-fuscous, tarsi dusky, closely covered with short, dense, dusky hair; the inferior edges of all the femora with short black bristles, each tibia with several long, slender, black bristles on the outer side; coxæ plumose, fore and middle ones anteriorly and hind ones outwardly, with dense black hairs; front metatarsi a little longer than the three following joints, but little thicker than the tip of the tibia. Wings but little darker apically.

***Hilara femorata* Loew.**

Cent. ii, 35.

Head black, opaque, antennæ and palpi black. Thorax and abdomen black, shining, with very short pubescence. Legs black, the knees, apex of the front tibiæ and the front tarsi brown, the posterior tarsi often fuscous, sometimes lighter; the front femora of both sexes much thickened, the male front metatarsi thick. Halteres black. Wings hyaline, the veins fuscous, stigma cinerascens, very faint. 2.6 mm.

Maryland (Osten Sacken), New Jersey, Ohio, Wisconsin.

***Hilara velutina* Loew.**

Cent. ii, 36.

Wholly black. Head velutinous, black-pilose, antennæ and palpi black. Thorax opaque, velvety, black-pilose. Scutellum moderately shining. Abdo-

men concolorous with the scutellum, black-pilose. Legs wholly black, with short black pile; the anterior metatarsi of the male oblong, incrassate. Wings blackish gray, the stigma dark fuscous.

District of Columbia (Osten Sacken).

***Hilara unicolor* Loew.**

Cent. ii, 37.

Head black, with black pile, the occiput cinereous-black, antennæ and palpi black, the proboscis very short. Thorax cinereous-black, opaque, covered with rather close black pile. Scutellum concolorous with the thorax. Abdomen black-cinereous, opaque, with black pile. Legs wholly black, with short black pile, the hind tibiæ covered with somewhat longer black pile; the front metatarsi (male) thickened. Halteres black. Wings pale cinerascens, stigma black. 3 mm.

Maryland (Osten Sacken), Massachusetts (G. de N. Hough).

***Hilara nigriventris* Loew.**

Cent. ii, 38.

Head black, with black pile, antennæ concolorous, occiput cinereous. Palpi yellowish, fuscous at base. Proboscis almost equal to the head. Thorax black-cinereous, closely black-pilose. Scutellum concolorous with the thorax. Abdomen black, shining, with black pile. Anterior coxæ yellowish, fuscous at base, posterior coxæ generally wholly black, often testaceous at the tip. Legs black, with short black pile, the base and the very tips of the front femora always yellowish, the base of the middle femora less often testaceous; front metatarsi of the male oblong, incrassate. Wings very pale cinerascens, stigma black. 2.6 mm.

Pennsylvania (Osten Sacken).

***Hilara trivittata* Loew.**

Cent. ii, 39.

Subopaque, black-cinereous. Head black, the frontal triangle larger than in the other species, it and the face cinerascens. Antennæ black. Palpi black, sub-cinerascens. Proboscis a little shorter than the head. Thoracic dorsum opaque, with fusco-cinereous pollen, three almost complete fuscous vittæ present, the black pile very short. Scutellum and pleuræ concolorous. Abdomen subopaque, with fusco-cinereous pollen, clothed with very pale subfuscous pile. Legs black, the pile very short. Wings cinereo-hyaline, stigma dark fuscous. 4.3 mm.

Illinois (Le Baron).

This species is very common in central Texas during the very early part of spring. For an account of its habits see *antea*, p 200.

***Hilara mutabilis* Loew.**

Cent. ii, 40.

Black. Head black, antennæ and palpi black, proboscis a little shorter than the head. Thoracic dorsum clothed with rather long black pile, and covered with cinereous pollen, so that seen from the side it is wholly cinereous, viewed from above it seems marked with three black vittæ, the middle one complete, the side ones much shortened. Scutellum concolorous with the thorax. Abdomen

black, almost shining, with sparse black pile. Legs black, with short black pile, the tips of the knees yellow. Halteres black. Wings dark cinereous, stigma black. 2.2 mm.

Illinois (Le Baron).

***Hilara brevipila* Loew.**

Cent. ii, 41.

Black, subopaque. Head black, the occiput cinerascens, with whitish pollen. Antennæ black. Palpi yellowish. Proboscis shorter than the head. Thoracic dorsum subcinerascens, with fine white pollen, with two faint approximated blacker vittæ, and clothed with short blackish pile. Scutellum same color as the thorax. Abdomen black, almost shining, very faintly cinereo-pollinose, black pilose. Legs black, the knees yellowish, the pile short and black, the tibiæ and metatarsi of the front and hind legs provided with a little longer pile above, anterior metatarsi of the male incrassate. Halteres black. Wings hyaline, stigma dark fuscous. 4.2 mm.

Illinois (Le Baron).

***Hilara atra* Loew.**

Cent. ii, 42.

Black, shining. Head black, black-pilose, antennæ and palpi black; proboscis shorter than the head. Thoracic dorsum black, shining, very slightly cinereous-pruinose, clothed with rather long black pile. Scutellum same color as the thorax. Abdomen black, shining, black-pilose, the somewhat lengthened hypopygium concolorous. Halteres black. Legs wholly black, with short black pile, the front tibiæ and the front metatarsi of the male strongly thickened, bearing rather long pile above. Wings subcinerascens, stigma almost black. 2.2 mm.

Illinois (Le Baron), Massachusetts, Colorado, N. Mex.

***Hilara leucoptera* Loew.**

Cent. ii, 43.

Black, moderately shining. Head black, occiput cinerascens, with whitish pollen. Antennæ black, the first two joints blackish brown. Palpi black. Proboscis a little longer than the head. Dorsum of the thorax subcinerascens, with fine whitish pollen, bearing blackish pile. Scutellum concolorous with the thorax. Abdomen black. Legs fuscous, in mature specimens almost black, knees dirty white. Halteres whitish. Wings hyaline, whitish, anterior veins pale yellowish, remaining veins dull whitish, stigma very weak; anterior branch of the third vein sharply ascending; second submarginal cell very short. 2.5 mm.

Florida (Osten Sacken).

***Hilara gracilis* Loew.**

Cent. ii, 44.

Head black, occiput cinereous. Antennæ black. Palpi yellowish. Proboscis about equal to the head. Thorax cinereous, not vittate, opaque, clothed with black pile. Scutellum the same color as the thorax. Abdomen black, moderately shining, black-pilose, faintly cinereo-pollinose. Legs testaceous or slightly fuscous; tibiæ fuscous, the base of the anterior ones, however, often testaceous;

tarsi dark brown, front metatarsi of the male oblong, incrassate, not provided with longer pile. Halteres black. Wings nearly hyaline, stigma dark brown. 3 mm.

Pennsylvania (Osten Sacken).

Hilara basalis Loew.

Cent. ii, 45.

Black, almost shining. Head black, occiput subcinerascens. Antennæ black. Palpi yellowish. Proboscis shorter than the head. Dorsum of thorax subcinerascens, with very fine whitish pollen, clothed with black pile. Scutellum same color as the thorax. The basal half of the abdomen testaceous or a little fuscous, the apical half black, very faintly cinereous-pollinose. Legs yellowish, tarsi except the base fuscous, the first joint of the fore tarsi of the male strongly thickened; the front tibiæ and the front metatarsi possess somewhat longer blackish pile above. Halteres yellowish brown. Wings gray, stigma dark brown. 3.3 mm.

Illinois (Le Baron).

Hilara macroptera Loew.

Cent. iii, 32.

Dark gray, opaque. Head concolorous, black-pilose. Antennæ black, the first two joints dark brown. Palpi piceous, provided with some longer black hairs. Proboscis black, rather thick, shorter than the head. Dorsum of the thorax not vittate, provided with rather long black pile. Abdomen black, opaque, black-pilose. Legs pale yellow, black-pilose, the outer half of the tibiæ and the whole of the tarsi black; the front metatarsi of the male moderately thickened, and the front tibiæ bearing very long black hair above. Halteres yellowish. Wings very large, distinctly grayish, subhyaline, pale yellowish at the base, veins subfuscous, pale yellow at the base, stigma elongate, cinereous, very faint. 2.7 mm.

District of Columbia (Osten Sacken).

Hilara lutea Loew.

Cent. iii, 33.

Yellow, opaque, clothed with short and sparse black hair. Head blackish cinerascens, with whitish pollen. The basal joints of the antennæ fuscous (the third joint wanting). Palpi yellow; proboscis black, thick, shorter than the head. Pleuræ faintly marked with grayish spots. Abdomen marked with basal blackish fascia on each segment. Legs paler than the rest of the body, the very tip of the tarsi fuscous, and the fore metatarsi of the male incrassate. Halteres pale yellow. Wings almost hyaline, pale grayish yellow, veins yellow, posterior ones subfuscous, second longitudinal recurved towards its apex, the front branch of the third vein obliquely ascending, 2.5 mm.

District of Columbia (Osten Sacken).

Hilara tristis Loew.

Cent. v, 62.

Wholly black, black-pilose, opaque, antennæ, head, hypopygium, halteres and legs concolorous, the pedicel of the halteres and the knees testaceous. Front wholly velvety. Dorsum of the thorax sprinkled with very sparse, pale cinere-

ous pollen, with three darker, almost obsolete vittæ. Legs slender, covered with short pile and a few black hairs, the front metatarsi of the male moderately thickened, oblong, except for the usual hairs, bearing three or four setæ above. Wings blackish, stigma black. 4 mm.

New Hampshire (Osten Sacken).

***Hilara seriata* Loew.**

Cent. v, 63.

Front black, a short vitta ascending from the antennæ more shining. Antennæ black, palpi testaceous. Thorax cinereous opaque, with no vittæ, the pile and the black setæ arranged in regular rows. Scutellum concolorous. Abdomen black, moderately shining, black pilose. Legs together with the coxæ testaceous, the front tibiæ towards the apex, and the hind ones, except the base, fuscous, all the tarsi almost black; the front metatarsi of the male thick, ovate; the middle tibiæ clothed with erect and rather long pile. Halteres testaceous. Wings cinereous, stigma dark gray. 2.5 mm.

New Hampshire (Osten Sacken).

NOTE.—Very similar to *Hilara gracilis*, but the thoracic pile arranged in regular series and the hairs of the middle tibiæ show a difference.

One specimen from New Jersey seems referable to this species. The stigma is nearly obsolete, however; all the tibiæ are strongly plumose, while the middle metatarsi, as well as the front ones, are thickened. The size is larger than Dr. Loew has indicated.

***Hilara testacea* Loew.**

Cent. v, 64.

Dark yellow, opaque, clothed with black, rather short and sparse hairs. Head black, cinerascens, with whitish pollen. The basal joints of the antennæ dark yellow, the third joint and its style black. Palpi luteous. Abdomen ringed with blackish fasciæ at the base of the individual segments, the fascia often wanting on the first segment. Legs a little lighter than the rest of the body, tarsi wholly fuscous, the apex of the posterior tibiæ often infuscated; front metatarsi of the male thickened; the middle tibiæ provided with long pile below. Halteres yellowish. Wings cinereous, towards the costa yellowish, stigma subfuscous. 2.8 mm.

New Hampshire (Osten Sacken).

NOTE.—This must not be confounded with *Hilara lutea*, which has less cinereous wings and the middle tibiæ with shorter pile below.

***Hilara Johnsoni* Coquillett.**

Proc. Nat. Mus., 1895, p. 395.

Black; the palpi, halteres, coxæ, femora and tibiæ yellow. Eyes of male separated over twice the width of the lowest ocellus. Head, thorax and scutellum opaque gray pollinose, that on the thorax somewhat yellowish, their short pile and bristles black; scutellum bearing four bristles; abdomen subshining, its pile rather long, black. Wings hyaline, stigma dark brown. Proboscis of male

slightly over one-half as long as, in the female fully as long as, the head height. Antennæ of male excessively long, over three times as long as the head, the female antennæ three times as long as the head, the third third joint is much the longest, its style coiled spirally. 4 mm.

Eufaula, Alabama (C. W. Johnson). Numerous specimens.

Hilara cana Coquillett.

Proc. Nat. Mus., 1895, p. 395.

Wholly black, including the palpi and knees. Head opaque gray pollinose, the pile black. First two antennal joints subequal in length, the third three times as long as the second, style nearly as long as the third joint. Proboscis as long as the height of the head. Eyes widely separated. Thorax opaque gray pollinose, marked with three brownish black vittæ, pile and bristles black; pleura naked. Scutellum bearing four black bristles. Abdomen and hypopygium opaque gray pollinose, the pile largely yellowish. Legs bearing rather long scattered pile, none of the femora unusually stout, front tibiæ more robust than the middle ones, front metatarsi greatly enlarged. Wings hyaline, stigma grayish black. In the female the front tibiæ are not thicker than the middle ones, and the front metatarsi are not enlarged. 4 mm.

Southern California (Coquillett).

Hilara viridis Coquillett.

Proc. Nat. Mus., 1895, p. 395.

Shining metallic green, the pleura largely black; antennæ, proboscis, hypopygium and legs yellowish brown; eyes separated the width of the lowest ocellus; proboscis slightly shorter than the height of the head; halteres black; pile and bristles of entire body black; scutellum bearing only two bristles; wings hyaline, veins yellowish, anterior branch of the third vein perpendicular to that vein. 2.5 mm.

Jamaica, West Indies (Cockerell).

Hilara aurata Coquillett.

Proc. Wash. Acad. Sci., 1900, p. 411.

Black, the first two antennal joints and the legs dark brown, the knees and halteres yellow; upper part of the occiput and sides of the front velvet black, middle of front below the lowest ocellus, face, cheeks and lower part of the occiput gray pruinose; eyes of male almost as widely separated as the posterior ocelli, third joint of the antennæ conical, slightly longer than broad, subequal in length to the style, proboscis as long as the height of the head, hairs of palpi and underside of the head whitish, those of the occiput yellowish brown; thorax slightly polished, marked with three, indistinct, black vittæ, almost bare, in the middle, behind the suture, with a golden yellowish pubescence, no hairs in front of the halteres, scutellum bearing four bristles and a few short hairs; abdomen slightly polished, its hairs yellow, hypopygium of male small, nearly bare; legs destitute of long bristly hairs, first joint of front tarsi of the male greatly swollen; wings hyaline, veins yellow, stigma pale yellowish, venation normal. 4 mm.

One female; July, Kukak Bay, Alaska (Kincaid). One male; Eastport, Maine (Nat. Mus.).

Hilara Wheeleri Melander (Fig. 95).

Psyche, 1901, p. 214.

Opaque true black, covered with a very fine gray-glaucous coating. Head, thorax and abdomen with a few pale short hairs in addition to the dark bristles. Antennæ black, short, third joint short, conical, its arista equal to itself. Palpi testaceous, with pale hairs; proboscis piceous, generally less than one-half the head height. Thorax not vittate, its short hairs irregularly, almost serially arranged; scutellum with four black bristles, the inner pair long. Abdomen opaque-black, most often compressed in the male and cylindrical or depressed in the female; no conspicuous bristles, the short sparse pubescence pale; hypopygium not of greater depth than the abdomen, sessile, rarely distinctly separated from the abdomen above, compressed, its lateral valves subglabrous, the dorsal filament thick, but almost always hidden. Legs fuscous to piceous. The males as a rule have the legs darker, but the fore tibiæ are always fuscous. The pubescence is pale yellow; no conspicuous macrochætæ are present, though the hairs of the upper edge of the male fore tibiæ are longer. The middle and hind coxæ are black, the fore coxæ more or less fuscous; tarsi black, the remainder of the legs variable in color, from fuscous to piceous. The front metatarsi of the males enlarged, ovoid, the distal third of the inner side is excised for the reception of the remainder of the tarsus, which thus is not attached to the tip of the metatarsus. The front tibiæ of the males are somewhat thickened. Wings cinereous-hyaline, stigmal spot faintly brown, neuration normal. 3.5 mm.

Wyoming (Wheeler).

In the lot of twenty specimens, one exhibited a peculiar case of tandem hermaphroditism. This specimen has the anterior part of the body formed as in the males, while the posterior portion is female. The reader is referred to the description in Psyche for an account of this case of gynandromorphism.

Species of *Hilara* described by Francis Walker.

Hilara plebeia Walker.

Trans. Ent. Soc. Lond., N. Ser., iv, p. 148.

Black; fore legs ferruginous; wings limpid, veins and stigma black; halteres tawny. 2.5 mm.

United States.

Hilara transfuga Walker.

List of Dipt. Ins., iii., p. 491.

Body black, clothed with short black hairs; eyes, mouth and feelers black; legs piceous, clothed with black hairs; wings dark brown; wing-ribs and veins black; brands black; poisers piceous. 4 mm.

Hudson's Bay. Ten specimens (Kincaid), Alaska; determination by Mr. Coquillett.

***Hilara migrata* Walker.**

List, etc., p. 491.

Body black, hairy; eyes piceous; feelers and lip black, the latter short; legs dark tawny, clothed with short black hairs; wings gray; wing-ribs, veins and posers piceous; wing-brands brown. 2 mm.

Hudson's Bay.

New species of *Hilara*.

***Hilara baculifer* sp. nov. (Fig. 96).**

Length 3.25 mm.—Gray-black. Head opaque, dirty gray-brown, black-bristly; eyes deeply notched at the antennæ. Antennæ black, somewhat shorter than the head, third joint elongate, lanceolate, with a thickened arista a little shorter than itself. Proboscis black, one-half to two-thirds the height of the head. Palpi black, directed forwards, strongly beset with black hairs below. Thorax dull brownish gray, dorsum with three brown bristly vittæ extending to the scutellum, scutellum with four marginal bristles. Abdomen moderately shining on the upper surface, hypopygium not elongate, its lateral pieces not very shining, a mid-dorsal, anteriorly directed, terminal process present. Legs piceous, moderately shining, with black pubescence and bristles, the anterior tibiæ two-thirds of the length of the femora, moderately incrassate, on outer edge bearing a fringe of long bristles, closely placed near tip; anterior metatarsi greatly lengthened and thickened, in length exceeding the femora, with no long bristles, remaining tarsal joints short and thick. Wings evenly infumated, stigma a little darker, veins brown, strong.

The halteres are broken from all the specimens.

Thirty-two specimens; Tifton, Georgia, 1896.

This species is very distinct in the structure of the front pair of legs.

***Hilara bella* sp. nov. (Fig. 94).**

Male. 3.5 mm.—Black, sparsely cinereous-pollinose. Head black, vertex and occiput velvet black, opaque. Face cinereous; a shining black triangle encroaches on the vertex above the antennæ. Antennæ black, short, less than one-half the length of the head, third joint conical, a little longer than its thickened style. Eyes shallowly emarginate at antennæ. Palpi black, with both pale and black hairs; proboscis black, not exceeding one-third the height of the head. Dorsum of thorax very lightly pale pubescent, almost blue-black when viewed from in back, subshining, cinereous when viewed from in front, the serial bristles pale, very short; pleuræ and coxæ cinereous. Abdomen finely cinereous, subshining, venter more gray; hypopygium cinereous, with smooth side pieces bearing a small posterior fringe of yellow hairs. Anterior faces of coxæ covered with yellow hair; femora and tibiæ subshining, black, except knees, tarsi more opaque black; anterior metatarsi moderately enlarged, slightly longer than the rest of the tarsus, not pilose; posterior tibiæ and tarsi densely covered with pale hairs. Halteres infuscated. Wings clear hyaline, veins firm, fuscous, stigma very obsolete, second submarginal cell normal.

A single male collected by Dr. Hough in Massachusetts.

***Hilara carbonaria* sp. nov.**

Length 3 mm.—Black over all except wings (halteres missing of all the specimens, but most probably black also). Thorax, occiput and front black, velvety; ocellar triangle not raised; antennæ two-thirds the height of the head, third joint thickened, not finely pointed, twice as long as basal joints together, the arista short, thickened, eyes not deeply notched at antennæ. Proboscis slender, pointed, in length equal to the antennæ; palpi generally hanging down and then longer than proboscis. Thorax very little shining along sides when viewed from the side. Seen from the front the dorsum has two faint piceous-gray glabrous stripes extending nearly to the scutellum. Vertex, thoracic dorsum, margins of abdominal segments and base of hypopygium with small black bristles, longer on hypopygium; scutellum with four marginal bristles, the inner pair long. Abdomen moderately shining; hypopygium large, compressed, almost carinate, abruptly rounding the abdomen, no parts exposed. Legs wholly black, anterior metatarsus of the male not much enlarged, shorter than the remainder of the tarsus, but little thicker than the tibia, hairy, and with a few bristles above; bases of legs moderately shining; femora and tibiæ bristly; hind tibiæ straight, very slightly compressed. Wings whitish, veins pale fuscous, no stigma, first vein thickened near insertion in costa, venation normal.

Two males and five females; New Bedford, Mass., June 12th.

This species is distinct from *velutina* Loew by the coloration of the wings and the absence of stigma.

***Hilara congregaria* sp. nov.**

Length 4 mm.—Head and thorax gray-black, faintly glaucous, slightly shining. Eyes narrowly, moderately deeply emarginate at antennæ. Antennæ black, third joint lanceolate, short, style thick, somewhat shorter than the third antennal joint. Occipital bristles brownish. Palpi testaceous, underside with pale hairs; each provided with a long dark seta exceeding the antenna in length, arising from the outer third of the underside. Proboscis black, generally shorter than one-half the height of the head. Thoracic bristles brown, acrostichals arranged in three series, thorax not vittate; scutellum with four marginal piceous bristles, the inner pair long; metathorax black, glaucous. The sparse marginal hairs of the abdominal sclerites pale. Abdomen piceous, sometimes fuscous at base; hypopygium compressed, not longer than the end of the abdomen, lateral valves small, serrate above, filament hidden. Legs pale testaceous, except the piceous front tarsi of the male, the hind tibiæ of the female and the gradually darkened remaining tarsi of both sexes; outer edge of anterior tibiæ and metatarsi of the male with pale downy hairs, at the tip of the tibiæ are a couple of stouter, darker hairs; no long hairs on remainder of legs, except on all the coxæ; anterior male metatarsi oblong, thickened, subequal to the remainder of the tarsus, anterior tibiæ slightly cylindrically thickened; female with anterior legs plain, a few short bristly hairs on anterior surface of middle femora, posterior femora curved, and posterior tibiæ incrassate, fusiform, as thick as the femora. Halteres testaceous. Wings clear hyaline, stigma at most very faint, veins light fuscous, neuration normal.

Thirteen males and seven females; Monterey Co., California, July 23, 1896. Collected by Dr. Wheeler.

On account of the rarely fuscous base of the abdomen, this species may become confused with *basalis* Loew, from which it may be readily distinguished by the brownish thoracic bristles.

This species, together with *nugax* sp. nov., is the *Hilara* mentioned by Mr. Wheeler in his paper on "Anemotropism and other Tropisms in Insects, p. 375,"* as dancing in swarms.

***Hilara nugax* sp. nov.**

This species differs from *congregaria* as follows:

Male.—Thoracic and cephalic bristles slightly longer and stouter, darker, piceous or black. Antennal style more slender. Palpi piceous, with darker hairs. Hypopygial lamellæ not serrated. Legs darker testaceous, piceous or black from the middle of the tibiæ; anterior metatarsi without long hairs above, underside straight. Halteres fuscous. Wings cinereous hyaline; veins darker fuscous, stigma dark fuscous.

Female.—Differs from the male thus: legs lighter in color, tibiæ with more reddish, metatarsi not incrassate. The hind tibiæ of the female are not at all thickened.

Twenty nine males and twenty-four females; Monterey Co., California, July 3 to 23, 1896. Collected by Dr. Wheeler.

HORMOPEZA Zetterstedt.

Rather small species. Antennæ much shorter than the head, apparently two-jointed, the terminal joint ovate, compressed, with a short, thick end-bristle. Eyes of the male contiguous above. Hypopygium of the male rounded, consisting of two convex, shining, hemispherical plates, between which reaches a short hairy process. Legs simple. Wings as in *Hilara*.

The species are distinguished from *Hilara* by the contiguous eyes of the males, the simple metatarsi of the males, and by the structure of the antennæ.

Stigma and veins fuscous; third antennal joint oval; knob of halteres blackish.

nigricans Loew.

No stigma, veins pale.2.

2. Third antennal joint oval; halteres and legs luteous**bullata** sp. nov.

Third antennal joint globose; halteres and legs fuscous.

brevicornis Loew.

Hormopeza brevicornis Loew (Fig. 87).

Cent. v, 65.

Head black, eyes of the male contiguous. Front shining above the antennæ.

* Archiv fuer Entwicklungsmechanik der Organismen. 8th Band, 3rd Heft. 1899.

Antennæ very short; first two joints short, yellowish; the third joint globose, black; the terminal short style black, its basal joint thick, its apical joint slender. Proboscis very short, thick, blunt, blackish brown; palpi minute, recurved, dirty white. Thorax black, cinereo-pollinose, opaque, clothed with pale hairs. Scutellum concolorous. Abdomen black, shining, with pale hairs; hypopygium concolorous. Legs fuscous, the apex of the coxæ, the very base of the femora, and the knees often luteous. Knob of the halteres subfuscous. Wings whitish, veins pale, no stigma. 3.3-3.5 mm.

Yukon River (Kennicott); South Dakota, Idaho, Wyoming.

These specimens exhibit in addition the following characters: The eyes of the males are large, occupying nearly the whole head, the upper facets large, the lower very small, the two sizes of facets well separated on a horizontal line. The abdomen of the male is more shining than in the female (of both sexes the base is almost translucent); the hypopygium is terminal, of moderate size, consisting of two convex, shining, side-pieces, and a dorsal short, backward-pointing, curved process. The head and thorax have a slight but distinct metallic tinge beneath the pollinous coating. The wings are broader, shorter and blunter than in *bullata*; the costal cell is well filled with brown. Lastly, the pulvilli are of dusky color and of normal size.

Hormopeza bullata sp. nov. (Fig. 88).

Female. Length 4.5 mm.—Head and thorax opaque black, abdomen shining black. Eyes widely separated. Antennæ a little more than one-third the eye height, stubby, black, third joint somewhat velvety, swollen, longer than broad, with a short, thick bristle. Palpi short, directed forward, luteous. Proboscis short, thick, black, in length one third the eye height. Postocular yellow bristles serially arranged. Thorax opaque-black, with a light cinereous or yellow tinge; bristles yellow, acrostichals and part of dorsals small, others long; scutellum with six long bristles, the apical pair of which are not close together. Pleuræ lightly cinereous-dusted. Abdomen compressed, shining black, with scattered, pale, short hairs; venter rufous to black. Coxæ and legs yellowish, uniformly colored, except the dusky tarsi; legs slender, tarsal joints oblong, gradually decreasing in length, four pairs of bristles on the hind tibiæ, hind femora with longest bristle-like hairs on the outer side near the tip, middle and front tibiæ with a few small bristles, pulvilli enlarged, pale yellow. Halteres yellow, dusky at extreme tip. Wings narrow, clear hyaline, nervures pale, brownish along costa, no stigma, anal angle prominent, costal cell opalescent.

While this species closely resembles *brevicornis*, its habitus is so different as to render it easily distinguishable. The larger size, the narrower, longer, more pointed wings, the large pulvilli, the oval third joint of the antennæ which also are a little longer, the opalescent costal cell, the opaque velvet black of the head and thoracic

dorsum, the black base to the antennæ, the solid black of the base of the abdomen, and the luteous halteres and legs, are all peculiar to this species.

Described from three females, from Jackson's Lake, Wyoming. Collected by Dr. Wm. M. Wheeler.

Hormopeza nigricans Loew.

Cent. v, 66.

Wholly black, with pale pile. Head concolorous, eyes of the male contiguous. Antennæ short, black, third joint oval, the basal joint of the short style thick, the apical one slender. Proboscis very short, thick, blunt, blackish brown; palpi small, recurved, dull white. Thorax opaque, cinereo-pollinose. Scutellum concolorous. Abdomen black, shining, hypopygium the same. Legs black, the apex of the coxæ and the knees luteous. Knob of the halteres blackish brown. Wings cinereous hyaline, stigma and veins fuscous. 4.1 mm.

Yukon River (Kennicott); Moscow, Idaho (J. M. Aldrich).

GLOMA Meigen.

Species of blackish or yellowish color. Antennæ shorter than the head, third joint oval, with a rather stout terminal arista, proboscis thick, not longer than the head. Eyes of the male contiguous above, of the female separated. Thorax rather prominent; abdomen compressed. Legs simple, the hind ones lengthened. Wings rather broad, the third vein imperfectly (?) forked; discal cell with three veins; anal cell shorter than the second basal, both bounded by a cross-vein almost parallel with the hind margin.

Yellow, red above; tarsi fuscous towards tip.....**rufa** Loew.

Black, abdomen yellowish basally.....2.

2. Legs simple.....**obscura** Loew.

Front tarsi and middle tibiæ in part swollen and hairy.

scopifera Coquillett.

The generic position of *Gloma phthia* Walker* cannot be determined from his description. It is therefore useless to repeat the diagnosis.

Gloma rufa Loew.

Cent. v, 67.

Yellow, reddish above, black-pilose. Head black, cinereous with white pollen. Proboscis and palpi yellow. First two joints of the antennæ rather short, yellow, black-pilose; third joint black, ovate, apex subacute, the seta rather thick, black. Tarsi fuscous towards the apex. Wings grayish yellow, stigma tinged a little darker, veins pale fuscous, yellow towards base and costa. 5 mm.

New Hampshire (Osten Sacken).

* Walker, List of Dipterous Insects, etc., iii, p. 492.

Gloma obscura Loew (Fig. 93).

Cent. v, 68.

Black, black-pilose. Head black, proboscis fuscous, palpi blackish. Antennæ black, first two joints rather short, black-pilose, the third short, ovate, the rather thick seta black. Abdomen shining, black, or piceous, base on each side yellowish, almost pellucid. Coxæ and legs yellowish, the hind femora and tibiæ infuscated apically, the last two joints of the tarsi black. Halteres yellowish. Wings grayish fuscous, stigma a little darker, veins fuscous. 5 mm.

New Hampshire, Idaho.

The third vein is perfectly furcate in the specimen in the collection.

Gloma scopifera Coquillett.

Proc. Wash. Acad. Sci., 1900, p. 412.

Male. Length 6 mm.—Black, a humeral dot, the halteres, second and third segments of the abdomen, except middle of dorsum, underside of fourth segment, and the legs, yellow, the greater part of the coxæ, middle of femora, apices of tibiæ, last two joints of front and middle tarsi, and whole of hind tarsi, except bases of first two joints, brown; all hairs and bristles black. Third joint of antennæ slightly longer than wide, less than half as long as the style. Thorax somewhat opaque, thinly gray pruinose. Abdomen slightly polished. Front tibiæ at apices bearing a dense cluster of rather long bristly hairs, last two joints of the front tarsi greatly dilated and fringed along the sides with short bristly hairs, middle femora beyond the middle of the underside bearing a cluster of about three long bristles, middle tibiæ swollen at middle of underside, the swelling densely covered with short, bristly hairs. Wings grayish hyaline, veins and stigma brown.

Alaska (Prof. T. Kincaid).

RAGAS Walker.

Small, slightly hairy species of black ground-color. Antennæ three-jointed, shorter than the head, the first two joints short, the third lanceolate, lengthened, provided with a short two-jointed arista, the second joint of which is very fine. Proboscis short, not porrect; palpi lengthened, provided with a few hairs beneath. Eyes of the female separated, of the male narrowly separated, the face long, the vertex short. Thorax short and rather broad, prominent. Legs rather long, intermediate femora of the male in our species without a spine. Wings with the third vein furcate, the upper branch not perpendicular; discal cell sending out three posterior veins; anal cell shorter than the second basal cell; anal angle not prominent.

Scutellum with six pale hairs.....**mabelæ** sp. nov.
Scutellum with ten black bristles.....**conjuncta** Coquillett.

Ragas mabelæ sp. nov. (Fig. 98).

Male. Length 3 mm.—Black species, covered with cinereous dust. Face very narrow, silvery, palpi white. Dorsum of the thorax diffused brownish, with four brown vittæ, the lateral two abbreviated anteriorly. Scutellum with six equidistant uniform pale marginal hairs. Abdomen slender, dusted with cinereous, the hypopygium terminal, projecting, globose and closed, dusted with cinereous, except beyond the margins of the broad, convex middle lamellæ. Legs slender, simple, devoid of any bristles, yellow, the tarsi apically and the hind legs from the middle of the femora outwardly brown; pulvilli small, square, empodium linear. Wings hyaline, with a very faint brownish tinge, veins dark brown; the costa curves outward to accomodate itself to the elongate faint stigma; marginal cell extending to the middle of the second submarginal cell; anal vein vanishing.

One male; Moscow, Idaho (Prof. J. M. Aldrich).

This is the first reported occurrence of this genus in America.

Ragas conjuncta Coquillett.

Empis conjuncta Coq., Proc. Wash. Acad. Sci., 1900, p. 411.

Black, the halteres and legs dark brown; venter of abdomen dark brown. Eyes of male contiguous. Third antennal joint linear, long, its style minute. Proboscis shorter than the head. Hairs and bristles of thorax and scutellum black; thorax very thinly gray pollinose, not distinctly vittate, scutellum bearing ten marginal bristles; abdomen slightly polished, hypopygium wholly and sparsely covered with bristly hairs, the dorsal piece bearing a pair of long subcylindrical, fleshy processes, which are covered with short hairs, filament free. Wings hyaline, veins and stigma brown. 2.5 mm.

Alaska (Prof. T. Kincaid).

The characters given above have been drawn from the description of *Empis triangula* Coq., which the present species is said to resemble, except in its generic characters. Its position in the genus *Ragas* is evident from Mr. Coquillett's résumé: "classified by its short proboscis, this species would be placed in the genus *Hilara*; but its elongated third antennal joint with the minute style, the contiguous eyes of the male and the slender first joint of his front tarsi, indicate a nearer relationship with the typical species of the genus *Empis*."

In the structure of the appendages of the hypopygium this species departs widely from *mabelæ*, but this difference is not of generic importance, as similar cases occur, *e. g.*, in the genus *Brachystoma*. The females of *B. occidentalis* and *vesiculosum* Fab. are undoubtedly related, but the males of the former bear prominent annexes to the lamellæ while in the latter they are wanting, judging from Mr. Mik's description.*

* Ent. Nachr., 1894, p. 154.

LAMPREMPIS gen. nov.

Lamprempis Wheeler et Melander (Subgen. *Empis*), Biol. Cent. Am., 1901, Dipt. Suppl., p. 366.

Small, short, broad, greatly humpbacked, metallic blue or blue-green flies. Eyes of the male contiguous. Thorax often with bushy short pubescence, the macrochætæ much reduced, either wanting or hair-like, even on the scutellar margin. Hypopygium prominent, three lateral valves varyingly developed, the central filament much reduced, generally apparently wanting. Legs of both sexes ornamented, of the female ciliate with scales or hairs on the edges, of the male sometimes more or less pennate. *Chichimeca* possesses remarkable processes on the male hind leg which are developed not alone at the knee, where similar processes are developed in typical *Empis*, when they occur, but also on the distal portion of the tibia and on the metatarsus; in *benigna* and *superba* also, there are thickenings in the same places; *violacea*, the only other species of which the male is known has no similar thickenings of the legs, but has instead the pennate ornamentation. Wings with the characteristic brownish tinge of the Mexican flies, more or less developed, most conspicuous along the costa; the veins narrow, brownish, becoming faint posteriorly, especially the anal and sometimes the fifth also; the third vein furcate far beyond the end of the marginal cell, its anterior branch perpendicular.

Wings hyaline, marked with black; hind legs of males with scales.

- | | |
|--|--|
| | violacea Loew. |
| Wings uniformly blackish; legs of male simple..... | superba Loew. |
| Wings hyaline or yellowish..... | 2. |
| 2. Tarsi black; middle and hind femora and tibiæ with flat scales on both edges (female) | cyanea Bellardi. |
| Tarsi at most fuscous | 3. |
| 3. Wings clear hyaline; legs not ciliate with scales (female) | suavis Loew. |
| Wings of a yellowish tinge..... | 4. |
| 4. Scales dense on both sides of the middle and hind femora and tibiæ (female); hind femora, tibiæ and metatarsi each with a peculiar process (male); wings uniformly colored..... | chichimeca Wheeler et Melander. |
| Scales few on the upper side of the femora (female); wings darker on the anteroproximal portion | 5. |
| 5. Hind tibiæ and metatarsi each with a brush of hairs (male); third antennal joint shorter than the first two united..... | benigna Osten Sacken. |
| Third antennal joint about equalling the first two. | |

diaphorina Osten Sacken.

Lamprempis violacea Loew (Figs. 103, 104).

Cent. viii, 55.

Male.—Blue, shining, covered with fine black pile. Head blue-black; eyes

contiguous; first two joints of the antennæ dull testaceous, third joint rather short, ovate, black, provided with a style equal to itself; proboscis short, piceous. Dorsum of thorax greenish blue; pleuræ piceous, opaque, shining blue before the base of the wings; pile in front of the halteres black. Color of the abdomen brassy blue, changing to violaceous towards the tip. Hypopygium small, short, black and black-pilose, supported by the last ventral segment which is arched and clothed with black pile; lateral lamellæ short, upper lamellæ excised; penis exposed, very slender towards the tip. Legs dark piceous, black-pilose, of the front and middle legs, the apical third of the femora, and the tibiæ except the tip, of the hind legs, the knees, the second and third joints of all the tarsi, together with the extreme apex and basal fourth of the first joint, pale lutescent; the front and middle tibiæ above with ordinary pile, towards the apex with compressed pile; the front and middle metatarsi above short-pennate; of the hind legs, the tibiæ and the femora compressed, the tibiæ pennate above, below with dense pile, the femora on both sides with feathery scales. Halteres blackish brown. Wings clear hyaline, the base, the costa, and the edges of the discal cell bordered very broadly with black, so that, except for a triangle extending from the axillary margin to the fourth vein, and except for the spot in the discal cell contiguous with the front margin of the triangle, the three posterior cells are hyaline, the basal half of the first and the base of the others excepted. The third longitudinal vein, besides the anterior, perpendicular, and slightly recurved branch sends another short branch into the first posterior cell, equidistant from the median cross-vein and the apex of the wing; discal cell broad, obliquely truncate; the fourth longitudinal and the intercalary veins slender, evanescent before the margin of the wing. 3.5 mm.

Mexico (Deppe, Berlin Museum).

One injured specimen labelled Mexico answers with this description, except that the hypopygium is broadly open, and evidently of different conformation.

***Lamprempis superba* Loew.**

Cent. viii, 57.

Male.—Brassy black. Proboscis equal to the head and thorax combined, fuscous. Antennæ black, the first two joints black-pilose, the first somewhat long, the apical style whitish. Eyes contiguous. Thorax and scutellum brassy green, shining, clothed with short black pile. Pleuræ brownish black, opaque, with a small subalar callosity and a median spot blue-green, black pilose in front of the fuscous halteres. Abdomen blue-green, merging into very bright cupreous towards the apex and chalybeous at the very tip. Legs black, closely covered with short concolorous pile, the tibiæ and the first joint of the tarsi moderately thickened, the front femora except the tip luteous, and the other femora circled by a subapical, very broad, luteous ring. Wings black, the front branch of the third longitudinal vein ascending straight to the costa. 4 mm.

Cuba (Poey).

***Lamprempis cyanea* Bellardi.**

Mem. d. Reale Accad. d. Scienze d. Torino, Ser. 2, vol. xxi, p. 199.

Female.—Metallic blue. Front broad, deep, shining, blue-black; first antennal

joint long, cylindrical, black, with long, dense, black hairs; second joint very short, black, black-pilose; third joint wanting. Proboscis equal in length to the thorax and head together. Occiput black, at the margin provided with long black bristles. Thorax much convex, black-pilose, shining, green-black, metallic, with faint vittæ; pleuræ and pectus jet black, from thence submetallic. Scutellum green-black, metallic, with long, black hairs on the posterior margin. Halteres wanting. Abdomen acute apically, cyaneous, metallic, black-pilose at the base. Front and middle legs short, hind ones gone; coxæ black; front femora broadly black at the base, apically yellow; front tibiæ broadly yellow at the base, and apically black; front tarsi wholly black, first joint long and much thickened; middle legs yellow, with the very base of the femora and the extreme tip of the tibiæ, and all the tarsal joints black; front femora and front and middle tarsi dark yellow-tomentose; front and middle tibiæ and middle femora with rather long yellow cilia. Wings hyaline, fuscous towards the base; submarginal vein straight, perpendicular to the third vein. 4 mm.

Angang, Mexico (Saussure).

In addition to this diagnosis the following points drawn from a female specimen from Amola in Guerrero, Mexico, will be of service:—Third antennal joint shorter than the first two united, pointed, its slender style equalling its own length. Mesonotum evittate. Hind femora and tibiæ fringed with scales on both sides, hind metatarsi not fringed; front metatarsi elongate, flattened and fringed.

Lamprempis suavis Loew.

Cent. viii, 56.

Female.—Front and face blue-green, shining; occiput chalybeous, moderately shining. Antennæ black, the first joint rather long, the third ovate, its bristle shorter than itself; proboscis a little longer than the head. Thoracic dorsum green, shining, chalybeous on the posterior margin. Pleuræ almost black, but green and shining before the base of the wings. Abdomen rather thick, bright chalybeous, shining. Femora piceous, extreme tip luteous; tibiæ lutescent, a little darker towards the tip, the apex of the hind ones fuscous; front tarsi fuscous, the middle joints lutescent, the first thickened; middle and hind tarsi pale lutescent, the last joints black. Halteres black. Wings very clear hyaline, veins fuscous; the first section of the fourth longitudinal vein altogether obsolete, its last part and the intercalary vein very slender, of a lighter color and vanishing before the tip of the wing; the sixth vein much abbreviated; the anterior branch of the third vein straight and perpendicular. 2.5 mm.

Mexico (Deppe, Berlin Museum).

A single female from Chilpancingo in Guerrero, Mexico, has the whole of the fourth vein uniformly developed.

Lamprempis chichimeca Wheeler et Melander (Figs. 100, 101, 102).
Biol. Cent. Am., Dipt. Suppl., p. 368, Nov. 1901.

Male.—Shining metallic green. Face and occiput black, dusted with white. Eyes contiguous on the front. Proboscis nearly as long as the head. Antennæ

black; third joint shorter than the first and second joints taken together, very nearly the length of the first joint; style very short. Mesonotum shining, metallic blue-green, with three deep blue stripes anteriorly, and beset with erect and rather dense brownish black hairs. Abdomen metallic green, with black hair. Hypopygium small, black, with only the base of the filament exposed. Pleuræ shining black, metallic blue-green anteriorly, dusted with white posteriorly. Legs black, covered with black hairs; knees, fore and middle tibiae and all the tarsi yellow. Fore metatarsi thickened, nearly as long as the remaining tarsal joints taken together. Middle legs plain. Hind femora on the inner inferior side with two slender finger-like processes, with an emargination between them; hind tibiae on the inner side with a stout subapical scoop-shaped process, truncated and flattened at the extremity; hind metatarsi incrassate, somewhat concave on the plantar side, and bearing on the outer side a prominent pointed projection tipped with two small black spines. Halteres black. Wings tinged with brown, yellowish anteriorly; veins yellow; stigma fuscous, slender and inconspicuous; anterior branch of the third vein short, rectangular.

Female.—Color, especially of the abdomen, more metallic blue. Face shining metallic blue. Middle femora below, hind femora above and below, and the four posterior tibiae on their inner and outer sides, with thick-set rows of black scale-like hairs. Middle and hind tibiae grooved on the outer side. Fore metatarsi incrassate, as in the male, hind metatarsi less thickened, and the legs wholly without the peculiar processes of the male. Stigma of the wings obsolete. 4.5 mm.

Guerrero, Mexico (Smith).

***Lamprempis diaphorina* Osten Sacken.**

Biol. Cent. Am., Dipt. Suppl., 1900, p. 215.

Female.—Antennæ black; third joint elongate, about as long as the first two united, with a short style. Occiput hoary, beset with black pile; front metallic green. Thorax metallic green, shining, with a vestige of three pollinose stripes on the dorsum, the latter sparsely beset with long, erect, black pile; meso- and sternopleura shining, metallic green; pteropleura black, slightly hoary; the fan-like row of bristles black; halteres black; metanotum slightly pulverulent. Abdomen metallic bluish, greenish at the base. Legs brownish yellow, the tips of the tarsi brown; the first pair beset with moderately long, delicate hairs, their first tarsal joint long, swollen; on the middle pair the hairs are shorter and more dense, fringe-like, especially on the underside of the femora; the hind tibiae are broad and flattened, and bear on each side a fringe of long, stout, almost scale-like hairs; similar fringes on the hind femora, but less conspicuous; coxæ black; trochanters brown. Wings with a pale brownish yellow tinge toward the root of the anterior margin; stigma hardly visible; hind margin grayish; the branch of the third vein nearly perpendicular; the first vein issuing from the discal cell turning anteriorly before its end; the first and second veins reach the margin, but are very thin and evanescent before it. Length about 4 mm.

Ciudad in Durango, Mexico.

***Lamprempis benigna* Osten Sacken.**

Biol. Cent. Am., Dipt. Suppl., 1900, p. 215.

Male and Female.—Antennæ black; third joint a little shorter than the preced-

ing two joints united, the division or suture occupying two-thirds its length and very distinct, the style short and stout. Face and front very dark metallic, shining, almost black. Thorax metallic green, shining, beset with long, erect, black pile; pleura metallic green, shining anteriorly, black, slightly hoary posteriorly; halteres and the fan-like bristles in front of them black. Abdomen metallic green (male), or metallic blue, green at the base (female); male genitals black. Legs black, the last pair of coxæ slightly pulverulent at the base, the knees slightly brownish yellow, the tarsi brown and with their first joint but slightly incrassate; in the male beset with long, soft, blackish hairs, the tip of the hind tibiæ bearing on the underside a small brush of very short, stiff bristles (which produces the appearance of an incrassation), and the yellowish brown first joint of the hind tarsi having on the underside a similar brush of bristles at the base, followed by a distinct emargination; in the female the middle femora on the underside, the middle tibiæ, and the hind femora and tibiæ on both sides, beset with fringes of long scale-like hairs, the hind tibiæ broadened, and with a groove on the outside. Wings of the male subhyaline, with a slight yellowish tinge in the subcostal cell, especially in the stigma; in the female this yellow tinge is more extended and occupies the whole antero-proximal half; venation as in *E. diaphorina*.

Mexico.

EMPIS Linnaeus.

Species of three to nine mm. in length (an undescribed female of uncertain provenience, probably Yucatan, measures ten mm.), often nearly glabrous, sometimes covered with long hairs, of black, gray or yellowish body color more or less completely concealed beneath a coating of grayish pollen, often with the legs peculiarly ornamented, the males with processes or swellings, the females sometimes with scale-like hairs. Antennæ generally longer than the head, the second joint shorter than the others except very rarely, the first two joints more or less cylindrical, the third compressed, lengthened, with a short, bristle-like terminal style. Proboscis at least as long as the head, frequently longer, stout, adapted for piercing, the labella of variable length. Eyes of the male separated or contiguous, of the female always separated. Thorax large, generally vittate, the darker vittæ generally in pairs; abdomen long, in the male generally narrow and with large genitalia of peculiar and variable form, consisting of two paired valves and a central filament, in the female generally flattened at the base and pointed apically, ending in two small narrow lamellæ. Sometimes the male venter is armed with processes near the tip and much distorted. Legs generally slender, more or less hairy and bristly, more prominently so in the male than in the female, the hind ones longest, often compressed and then generally ciliate with scales or hairs

along the edges; hind legs of the male frequently armed at the knees or trochanters; fore metatarsi of the males sometimes enlarged. Wings generally narrow, with the front and hind margin more or less parallel, the discal cell always present, emitting three simple veins to the wing margin; third vein always furcate; anal cell shorter than the second basal, both bounded by a vein nearly parallel with the hind margin of the wing; anal angle prominent, but rarely projecting.

Several attempts have already been made to divide this complex genus into groups of species. Dr. Loew in a series of papers in the *Berliner Entomologischer Zeitschrift*, vol. xi-xiii, has grouped the European species about a few typical forms, and the same may be done with more or less completeness in the case of the American species. The genus *Enoplempis*, erected by M. Bigot* for those species of *Empis*, the males of which have armed hind knees, fell in Mr. Coquillett's Revision. His reasons for the abandonment of the genus were that it was established on characters found in the male sex only, and that the females were indistinguishable from typical *Empis*. Although this may not be a sufficient reason for the dissolution of a genus; for example, witness those dolichopodid genera founded on male characters alone, such as *Polymedon*, which are considered valid, yet *Enoplempis* is not here reinstated with generic value, as it merges with other *Empis* through the species *nodipes* on the one side and *teres* on the other.

The subgenus *Lamprempis* † deserves a better fate, for as yet, it is very exclusive and probably will always remain so. Its distinctive character, a color difference, it is true, is yet so deep seated that it can be regarded as morphological. Intergrades between the yellows and blacks of *Empis* are common, but an intergrade between the metallic blue of this group and the ordinary color of *Empis* would be difficult to conceive of, and hence, especially as the species all present a similar facies which is quite different from that of the rest of the group, we feel justified in raising *Lamprempis* to the rank of a genus.

Empimorpha, founded by Mr. Coquillett on *Empis barbata* Loew, has been allowed to remain as a distinct genus, although its relationships with the group *Aldrichii* of *Empis* are quite evident.

* Bull. Soc. Ent. France, 1880, p. 47.

† Wheeler et Melander, Biol. Cent. Am., Nov., 1901, p. 366.

The species *E. sociabilis* Williston* (synonym *Rhamphomyia abdita* Coquillett) is not included in the table as it is a true *Rhamphomyia*, and was originally given as *Empis* only through a typographical error.

Two of Walker's species, *agasthus*† and *reciproca*‡ have been dropped, and, likewise, Loew's *poplitea* has been omitted from the table on account of insufficient characterization.

In attempting to place species with the aid of the following table, too much reliance must not be placed on the wording, as this genus, and indeed the whole family as well, is in a state of extreme "morphological restlessness." The instability of the species manifests itself often in the coloration, often in the chaetotaxy. Stress is laid in the key on the number of scutellar and metapleural bristles, but this character is variable and often misleading, so that only within certain limits can it be accepted. Moreover, greasy, immature, or rubbed specimens may often lead one astray; thus it is only after a comparative knowledge of a number of forms that a determination may be relied upon.

More or less yellow species, <i>i. e.</i> , pleuræ largely yellow, thoracic dorsum at least partly yellow along the sides.....	2.
Black, gray, or brown species; pleuræ never yellow.....	22.
2. Occiput black, more or less cinereous dusted.....	3.
Occiput yellow	17.
3. Thorax and abdomen unicolorous, red	4.
Thorax and abdomen more or less vittate with blackish	5.
4. Stigma distinct; anterior branch of the third vein perpendicular; body with no black bristles.....	rubida Wheeler et Melander.
Stigma wanting; second submarginal cell acute; body with black bristles.	rufescens Loew.
5. Halteres blackish; thorax with a longitudinal black stripe.	leptogastra Loew.
Halteres whitish or reddish	6.
6. Dorsum of thorax evenly blackish; antennæ black	7.
Dorsum of the thorax with darker vittæ.....	10.
7. Sides of the thorax and venter with long yellow pile.	laniventris Escholtz.
Not yellow pilose.....	8.
8. Tibiæ apically blackish	loripedis Coquillett.
Tibiæ yellow.....	9.
9. Abdomen opaque	amytis Walker.
Abdomen shining	gladiator sp. nov.

* Kans. Univ. Quart., vol. ii, p. 76.

† List of Dipt. Ins, iii, p. 496.

‡ Trans. Ent. Soc. Lond., N. Ser., iv, p. 147.

10. Thorax trivittate.....**tridentata** Coquillett.
Thorax not trivittate.....11.
11. Abdomen largely black.....12.
Abdomen largely yellow.....16.
12. Antennæ black.....13.
Antennæ fuscous at base.....15.
13. Shining; abdomen in part yellow.....14.
Abdomen wholly black.....**ollius** Walker.
14. Tip of hind tibiæ black.....**loripedis** Coquillett.
Tip of hind tibiæ yellowish.....**gladiator** sp. nov.
15. Tip of femora black.....**eudamidas** Walker.
Tip of hind femora concolorous with rest, reddish.....**abcirus** Walker.
16. Base of abdominal segments fuscous, rest yellow.....**sordida** Loew.
Tip of abdominal segments blackish, rest yellowish.....**longipes** Loew.
Whole insect yellow.....female of **humile** Coquillett (?).
17. Cross-veins bordered with brown.....**pæcilopectera** Loew.
Cross-veins not bordered.....18.
18. Thorax with five vittæ; hind femora fuscous above.....**mira** Bigot.
Thorax not vittate; femora not darkened above.....19.
19. Abdomen yellow, with rather long yellow pile.....**pallida** Loew.
Abdomen fuscous, with short black hairs.....20.
20. Antennæ yellow basally; thorax opaque.....**armipes** Loew.
Antennæ black; thorax shining.....**colonica** Walker.
21. Pile of thorax and at base of abdomen in part pale.....22.
Pile wholly black.....31.
22. Species of 3 mm.....23.
Larger species of 5-10 mm.....25.
23. Stigma dark fuscous; antennæ black.....**obesa** Loew.
Stigma wanting; antennæ reddish at base.....24.
24. Abdomen more or less yellow.....**compta** Coquillett.
Abdomen wholly black.....**varipes** Loew.
25. Knob of halteres black; abdomen largely shining.....26.
Halteres yellow; abdomen opaque.....27.
26. Mesonotal hairs white.....**comantis** Coquillett.
Mesonotal hairs black.....**brachystoma** Coquillett.
27. Scutellum with 6 to 8 bristles; antennæ black.....**ravida** Coquillett.
Scutellum with fewer bristles; antennæ red basally.....28.
28. Dorsum of abdomen brown pollinose; scutellum with two bristles; legs of
female ciliate, with short black scales.....**captus** Coquillett.
Scutellum with 4 bristles; legs not feathered.....29.
29. Pile of body luteous.....**Aldrichii** sp. nov.
Pile of body white.....30.
30. Stigma brown, wings gray; abdomen blue-gray pollinose.
avida Coquillett.
Stigma wanting, wings whitish; abdomen brown-pollinose.
lævicula Coquillett.
31. Fourth vein incomplete; thorax evittate; eyes of male contiguous (of the
known males).....32.

- Fourth vein reaching the margin of the wing; thorax almost always conspicuously vittate; eyes of the males separated (as far as known with very few exceptions)39.
32. Wings spotted with brown, anterior branch of the third vein perpendicular33.
- Wings unspotted, first submarginal cell open34.
33. First submarginal cell generally closed; fourth vein not forked.
- clausa** Coquillett.
- First submarginal cell open; the shortened fourth vein furcate.
- spiloptera** Wiedemann.
34. Third antennal joint five times as long as wide, style minute.
- triangula** Coquillett.
- Third joint shorter, style comparatively longer35.
35. Second submarginal cell wider than the first posterior cell...**distans** Loew.
- Second submarginal cell subequal in width to the first posterior36.
36. Wings dark brown37.
- Wings but little infumated38.
37. Knob of halteres yellowish above; eastern species.....**labiata** Loew.
- Halteres black, with paler pedicel; Mexican species...**totipennis** Bellardi.
38. Joints of the male front tarsi globose and provided with long hairs.
- asema** sp. nov.
- Joints of the tarsi slender, not long-hairy.
- dolorosa** Wheeler et Melander.
39. Legs, at least femora, nearly black or wholly black40.
- Legs, at least in large part, yellowish or reddish55.
40. Abdomen wholly black41.
- Abdomen yellow at the base; legs of female feathered.
- pegasus** Osten Sacken.
41. Knob of halteres pale42.
- Knob of halteres at least infuscated49.
42. Eyes of male contiguous; thorax wholly shining..... **laevigata** Loew.
- Eyes of male separated; thorax vittate43.
43. Venter of male with a subapical process; legs simple; thorax and abdomen somewhat shining44.
- Abdomen of male simple; male hind legs with processes; thorax opaque....47.
44. Ventral process of fifth abdominal segment of male with long hairs.....45.
- Ventral process with short or no hairs46.
45. Mesonotum with three shining vittæ; scutellum with four bristles.
- pellucida** Coquillett.
- Mesonotum evittate; scutellum with six or more bristles.
- fumida** Coquillett.
46. Ventral process with short hairs; central filament hidden.
- virgata** Coquillett.
- Ventral process devoid of bristles; central filament exposed.
- infumata** Coquillett.
47. Outer process of hind tibiæ of male simple; middle legs not tipped with many spurs48.
- Outer process of male hind knees large, pronged; middle tibiæ tipped by a circle of spurs.....**serperastrorum** sp. nov.

48. Abdomen largely shining black.....**podagra** sp. nov.
 Abdomen wholly opaque pollinose**seripes** sp. nov.
49. Wings subhyaline50.
 Wings dark, at least apically53.
50. Thorax with three gray vittæ; veins strong**cormus** Walker.
 Thorax black; veins weak.....51.
51. Tarsi black.....**xochitl** Wheeler et Melander.
 Tarsi strongly annulate.....52.
52. Front metatarsi enlarged; second antennal joint large, yellow.
atrifemur Wheeler et Melander.
 Front metatarsi slender; second antennal joint small, dark.
annulipes Wheeler et Melander.
53. Scutellum with four bristles.....54.
 Scutellum with about twenty bristles.....**luctuosa** Kirby.
54. Wings pale at base, reddish apically; filament of hypopygium black at base.
bicolor Bellardi.
 Wings dark brown; filament red...**montezuma** Wheeler et Melander.
55. Abdomen conspicuously shining.....56.
 Abdomen pollinose, opaque.....62.
56. Scutellum with two bristles; thorax distinctly quadrivittate57.
 Scutellum with four bristles; lateral vittæ indistinct.....60.
57. Hind knees simple; hind margin of the abdominal segments narrowly cinereous**nuda** Loew.
 Hind knees armed in the male; abdomen without cinereous fasciæ58.
58. Front tibiæ apically, and front metatarsi wholly brown.
loripedis Coquillett.
 Legs almost wholly yellow.....59.
59. Humeri yellow.....**gladiator** sp. nov.
 Humeri dusted with cinereous.....**arthritica** sp. nov.
60. Antennal style one-third as long as the third joint.....**otiosa** Coquillett.
 Antennal style one-half as long as the third joint61.
61. Eyes of the male contiguous; abdomen of male deep velvet black at the base;
 abdomen of female shining black**Johnsoni** sp. nov.
 Eyes of male separated; abdomen of male shining black over all (female abdomen largely yellow).....**humile** Coquillett.
62. Abdomen yellow at base.....**tersa** Coquillett.
 Abdomen black or brown above63.
63. Antennæ short, reddish at base.....**tenebrosa** Coquillett.
 Antennæ black, or with base at most fuscous64.
64. Halteres black; male legs armed, the inner projection of their hind tibiæ with a terminal spur-like brush; upper hypopygial lamellæ projecting; tips of femora, tibiæ and all of tarsi black; a dense bunch of hair in front of the halteres**valentis** Coquillett.
 Without all these characters.....65.
65. Anal vein not reaching the margin; legs slender; wings rather long, pure hyaline66.
 All the veins strong, fuscous.....67.

84. Third vein furcate beyond the tip of the marginal cell.

dolabraria sp. nov.

Third vein furcate before the tip of the marginal cell.

dolabraria subsp. **disconvenita**.

85. Front metatarsi thickened, black; hind tibiæ shaggy...**canaster** sp. nov.

Front metatarsi slender, red; legs not shaggy.....**falcata** sp. nov.

86. Third antennal joint short and broad; second segment of abdomen with a conspicuous fringe of long black bristles toward the sides; abdomen brownish pollinose.....**gulosa** Coquillett.

Third antennal joint long, slender; abdomen generally gray pollinose....87.

87. Slender species; dusted with whitish; wings narrow; base of the femora and tibiæ paler than the apex.....**stenoptera** Loew.

Of other conformation.....88.

88. Species marked with yellow.....**clauda** Coquillett.

Ground color wholly black.....89.

89. At most three bristles in front of the halteres; antennæ comparatively long...90.

Several bristles in front of the halteres; antennæ shorter.....91.

90. Hind coxæ with conspicuous hairs on their front side**falcata** sp. nov.

Hind coxæ with but few apical hairs.....**nuda** Loew.

91. Third vein furcate beyond the tip of the marginal cell, the posterior branch ending before the apex of the wing; occiput densely bristly92.

Furcation of the third vein opposite or in advance of the tip of the marginal cell, the posterior branch terminating at or beyond the wing tip...94.

92. Large gray-white species devoid of brownish pollen; third vein distinctly arched forward so that the first submarginal cell is narrowed.

seripes sp. nov.

Smaller species, in part brownish pollinose; third vein straight before its furcation93.

93. With six scutellar bristles**dolabraria** sp. nov.

With four scutellar bristles.....**mixopolia** sp. nov.

94. Legs glaucous; abdominal segments margined with gray posteriorly.

cacuminifer sp. nov.

Legs shining; abdomen unicolorous.....95.

95. Vein between discal and fourth posterior cells much shorter than that between the third and fourth posterior cells.....96.

The two sections equal**dolabraria** subsp. **disconvenita**.

96. Species of the Middle States; hind tibiæ straight, rather stout cylindrical; hind femora with numerous thorn-like bristles distally.

enodis sp. nov.

Species of the Western States; hind tibiæ distinctly bent near the knee; bristles of the hind femora longer.....97.

97. Coxæ generally wholly black; abdomen brownish dusted; middle tibiæ fimbriate apically with a few stiff black bristles.

serperastrorum sp. nov.

Coxæ reddish apically; abdomen slaty gray; middle tibiæ not spurred with terminal bristles**canaster** sp. nov.

Empis annulipes Wheeler et Melander (Fig. 115).

Biol. Cent. Am., Dipt. Suppl., Nov., 1901, p. 369.

Female.—Black. Front and face dusted with white. Antennæ black; the third

joint largely or wholly reddish yellow, about half as long as the first; third joint tapering, about twice the length of the first two together; style very minute. Proboscis reddish, about as long as the thorax. Thorax rather thickly gray dusted, the dust modifying the ground color; mesonotum with four slender darker stripes; pile and bristles black, the former abundant, erect; humeral and postalar callosities reddish. Scutellum with six bristles. Abdomen black, grayish dusted, color very variable in different reflections. Legs reddish yellow; front and hind tibiæ on the distal portion, middle tibiæ at the tip, front metatarsi (except the immediate base), and the tips of all the other tarsal joints dark brown or black; front metatarsi elongate and thickened; all the tibiæ with rather dense hairs on the outer side, but not ciliate. Wings uniformly light yellowish brown; discal cell long. Halteres black, with yellow peduncles. 8-9 mm.

Guerrero, Mexico (Smith).

Empis antifemor Wheeler et Melander (Figs. 116, 117).

Biol. Cent. Am., Dipt. Suppl., 1901, p. 370.

This species, which is closely allied to *E. annulipes*, was established on a single female specimen from Guerrero, Mexico. It differs from *annulipes* thus; antennæ shorter; the second joint comparatively long, of nearly the same size as the first joint; the first and second joints of the antennæ light yellow, but the first joint a little the darker however; style more slender. Proboscis piceous. Mesonotum apparently evittate. Femora black, the anterior ones brownish towards the tip. Front metatarsi shorter and rather thickened. The hairs of the legs are longer and denser, especially on the hind pair.

Empis montezuma Wheeler et Melander (Fig. 114).

Biol. Cent. Am. Dipt. Suppl., Nov., 1901, p. 369.

Male.—Black, opaque, cinerascens. Eyes contiguous on the vertex. Proboscis one and one-half times the length of the head. Antennæ dark fuscous, first joint short, with a few bristles near the apex, third joint wanting. Thorax black, cinerascens, with indications of a median and two side stripes showing black through the coating, sparsely hairy on the disc, densely and strongly so on the humeri and about the scutellum. Pleuræ and pectus concolorous with the mesonotum; abdomen shining in certain lights, velvet-black in others, fuscous on the venter at the base. Halteres black. Hypopygium small, black; lamellæ incrassate, deeply emarginate, with loose dark hairs and small apical teeth; median style densely, finely plumose; penis exposed, reddish. Legs black, the femora and the base of the tibiæ with a reddish tinge; furnished with spines, hairs and pile, the pile long and denser on the middle femora beneath near the base, the middle tibiæ beneath near the tip, the posterior tibiæ on the outer edge, the first and second tarsal joints and the hind metatarsi outwardly; middle femora and tibiæ arched; front metatarsi equal in length to the next two joints (in *E. bicolor* the metatarsi are longer). Wings uniformly dark fuliginous; neuration as in *E. bicolor*. 6.25 mm.

Jalisco, Mexico (Schumann).

Empis bicolor Bellardi (Figs. 112, 113).

Mem. della Reale Accad. d. Scienze di Torino, Ser. 2, vol. xxi, p. 198.

Female.—Black, cinereous. Eyes widely separated; front and face flat, black, cinereous, dorsum of the thorax with two obsolete vittæ, pilose; pile sparse, black, stiff; pleuræ and pectus concolorous with the thorax; halteres black, at the base fuscous. Abdomen depressed, black, cinerascens and black-pilose. Legs wholly jet black, black tomentose, spinose, and pilose, the tomentum, spines and hairs denser and longer on the inner and outer sides, but not arranged as regular cilia. Wings rounded at the apex, uniformly and rather strongly fuliginous, subhyaline at the extreme base, flavescent. 5 mm.

Cuantla, Mexico (Saussure). Numerous specimens. Guerrero.

The male has the middle metatarsus very short, in the female the tarsal joints are slender and gradually decreasing in length. The male differs thus: eyes contiguous above; face more gray, narrower, though its sides are still parallel; hypopygium slightly ascending, not large, the reddish yellow filament rather strongly recurved, black outwardly, and with tip concealed. Bristles on the legs longer and denser, disposed in patches as in *montezuma*. Middle metatarsi but little more than one-half the length of the following joint; wings uniformly clear, with a flavescent tinge, nerves weak.

It may be thought that *E. montezuma* Wheeler et Melander is a variety of this species. It is indeed closely related. Here, also, the middle metatarsi are short, though they are subequal to the next joint, but the dark broader wings and lighter color of the legs and hypopygium distinguish the form from *bicolor*. None of the ten specimens of *bicolor* examined shows any deviation from the opaque jet black of the legs and body. Moreover, the hypopygial filament of *montezuma* is less recurved and wholly reddish; the discal cell of the wings is deeper, while the outer cross vein is strongly bent and perpendicular to the sixth vein; and the submarginal cell is much shorter, more nearly equilateral.

Empis azteca Wheeler et Melander (Fig. 119).

Biol. Cent. Am., Dipt. Suppl., Nov., 1901, p. 369.

Female.—Black. Head thickly grayish-pollinose, the ocellar spot in some reflections showing black. Face shining black below, gray-pollinose below the antennæ. Antennæ black, longer than the head; third joint gently tapering, as long as the first; style minute. Proboscis and labella reddish yellow, black at the base, altogether about as long as the thorax. Thorax opaque gray, variable in color in different reflections; pile erect, black; margin of the scutellum with a row of long hairs. Legs yellow, with black hairs; femora, except the tip, black; last joint of all the tarsi brown or black. Wings uniformly yellowish brown; anterior branch of the third vein very short, rectangular; fourth vein

arched back, distant from the third at the tip; penultimate section of the fifth vein unusually short, not twice the length of the anterior cross-vein; discal cell small. Halteres black, with yellow peduncles. Abdomen thickly gray-pollinose, the second and third segments wholly shining black. Front metatarsi dilated and darker than the second to the fourth tarsal joints. 6 mm.

Guerrero, Mexico (Smith).

***Empis pegasus* Osten Sacken.**

Biol. Cent. Am., Dipt. Suppl., p. 216.

Female.—Black; front moderately broad, opaque; face shining. Antennæ black; third joint not longer than the first, triangular, slightly excised on the underside, the arista as long, or a little longer. Thorax black, with a trace of three grayish stripes. Abdomen with the four basal segments ochraceous yellow, opaque, shining on the incisures only; the last segments black, shining. Legs dark brown or black; femora, tibiæ and tarsi beset with broad fringes of scale-like hairs (on the anterior femora alone the fringes are replaced by hairs); the four hinder femora and the tibiæ distinctly flattened. Wings with a uniform brown tinge; the branch of the third vein slightly oblique. 7 mm.

Volcan de Chirique, Panama, Central America.

***Empis xochitl* Wheeler et Melander (Fig. 118).**

Biol. Cent. Am., Dipt. Suppl., Nov. 1901, p. 370.

Female.—Robust, dull, opaque-black throughout, the only lighter portions being the piceous proboscis, the base of the halteres and the subhyaline wings. Front of uniform moderate breadth. First antennal joint short, second still shorter, the third slightly longer than the other two together; arista forming a continuation of the third joint, stout. Proboscis twice as long as the eye-height. Margin of the first abdominal segment fringed with black bristles, which are stronger laterally. Legs not ciliated, though the longer hairs are serially arranged on the underside of the femora and on the inner and outer sides of the tibiæ; front metatarsi slightly compressed. Wings almost hyaline; no stigmal spot; anterior branch of the third vein obliquely disposed; anal vein attaining the margin. 4 to 5 mm.

Guerrero, Mexico (Smith).

***Empis totipennis* Bellardi.**

Mem. d. Reale Accad. d. Scienze d. Torino, Ser. 2, vol. xxi, p. 199.

Female.—Black cinereous. Antennæ black. Proboscis equal to the head and thorax together. Halteres black, paler towards the base. Legs black-brown; front femora more or less ciliated on the inside; middle and hind femora and all the tibiæ on the inner and outer sides with long, regular cilia; all the tarsi tomentose and spinose, not ciliated. Wings wholly fuliginous, the duskiness darker at the stigma; first submarginal vein arcuate, subsinuous; first posterior vein not reaching the margin of the wing. 5 mm.

Morelia, Mexico (Saussure).

***Empis spilopecta* Wiedemann.**

Empis spilopecta Wiedemann, Auss. Zw., ii, 5, 10.

Empis picta Loew, Cent. iii, 28.

Male.—Head black, occiput cinerascens. Eyes contiguous along the front. Antennæ black, moderate, third joint acuminate, the terminal style rather long. Palpi black. Proboscis badius, exceeding twice the length of the head, labium deeply bipartite. Thorax and scutellum black cinereous, black-pilose. Abdomen dark brown, moderately shining, black-pilose; hypopygium rather large, subglobose, closed, the upper lamellæ short, dark badius, the central filament hidden. Coxæ piceous. Femora pale testaceous, at the very apex spotted with a black dot; the anterior tibiæ testaceous at base, piceous towards apex; hind tibiæ piceous, the base, however, testaceous; tarsi piceous, the very base of each joint testaceous; the whole of the legs clothed with long black hair. Knob of halteres infuscated. Wings pale fuscous, the veins a little more dusky fuscous, the apex of the second longitudinal vein recurved, the anterior branch of the third vein ascending perpendicularly, the fourth vein abbreviated and furcate by an adventitious branch below before the apex; stigma oval, fuscous; the cross-veins, the adventitious branch of the fourth vein, and the costa between the branches of the third vein bordered with fuscous; discal cell broad. 4.2 mm.

Mexico.

***Empis clausa* Coquillett (Fig. 129).**

Proc. Nat. Mus., 1895, p. 401.

Male.—Head black, subshining, eyes contiguous, upper facets larger than the lower ones; antennæ black, the third joint quite short, rather broad at the base; style two-thirds as long as the third joint; proboscis two and one-half to four times as long as the height of the head, palpi brown. Thorax, pleura and scutellum black, opaque, gray pollinose, pile in front of the halteres black; scutellum bearing two bristles. Abdomen black, subshining, towards the base more or less tinged with yellow, its pile black; hypopygium very small, correct; filament slender, yellow, hidden, except on the basal half. Legs slender, simple, the middle and hind femora and all the tibiæ furnished with much very long black pile; coxæ yellow, the hind ones brown; femora yellow, the hind ones, except at base, blackish; tibiæ and tarsi blackish, extreme base of each tibia yellowish; hind tibiæ greatly dilated towards the tip, bowing inwardly at the middle; front metatarsi nearly twice as thick as the middle ones, hind metatarsi nearly as thick and slightly longer than the front ones. Knob of halteres blackish. Wings hyaline, stigma and a front border to the anterior branch of the third vein and on the small and posterior cross-veins dark brown; veins brown, fourth vein obliterated before reaching the wing margin, anterior branch of the third vein usually ending in the second vein, closing the first submarginal cell; contact of discal and fourth posterior cells much longer than that of the third and fourth posterior cells.

Female.—Differs from the male in that the legs are wholly brown, compressed, and that the upper and under sides of all the femora, outer and inner sides of all the tibiæ, and the upper sides of the front and hind metatarsi ciliate with long, nearly erect scales. Base of abdomen never winged with yellow. 4 mm.

Illinois (Robertson).

This species is common throughout the western part of the United States.

At first reading this may seem to be the same as *E. spilopectera*,

but it is quite different, as Mr. S. W. Henshaw tells me, in the coloration and venation; although these two characters are capable of great variation in this species.

Empis asema sp. nov. (Fig. 130).

Male and Female. Length 4 mm.—Black, gray pollinose, somewhat shining. Head small, occiput gray pollinose, black-bristly; eyes broadly contiguous in the male, and widely separated in the female, facets large above, small below (male), and uniform (female); antennæ moderate, slender, black, first joint rather short, the second joint as long as the first, third joint one and one-half times the length of the first two, broad at the base, suddenly narrowed to mid-way its length, then nearly uniform to the tip, arista three-fourths the length of the third joint; proboscis black, slender, over twice as long as the height of the head; palpi small, slender, black. Thorax shining, sparsely gray-coated, disc with several short black bristles and margined with a few longer ones, scutellum with two apical bristles; pleuræ less shining, and more closely pollinose, the row of black bristles in front of the halteres consisting of about seven. Abdomen subshining, gray pollinose, a little darker than the thoracic notum, rather long and slender, cylindrical in the male, and short, depressed in the female, not conspicuously bristly, its few hairs black; hypopygium closed, subcompressed, small, with several short black hairs, filament yellow, exposed at the base, not thick. Legs short, robust, of the male the coxæ have small bunches of fine black hairs on the anterior side, the femora and tibiæ are regularly ciliate, with long slender black hairs beneath, otherwise hairy, and with a few black slender bristles on the upper side of the middle and hind tibiæ and tarsi; the front metatarsi flattened, broad, nearly as long as the remainder of the tarsus, the next three joints of the front tarsi globose, densely black-bristly, the last joint slender, short, flattened; middle legs slender; hind legs rather stout, the metatarsi stout, three times as thick and one-half again as long as the middle ones. Of the female the coxal hairs, those of the under side of the front femora, of both edges of the other femora and of both edges of all the tibiæ assume a flattened scale-like character, much pronounced on the posterior legs; tarsi slender, hind metatarsi but little thicker than the middle ones. Halteres infuscated. Wings hyaline, distinctly infumated, broad, rounded, basal cells short, the fourth vein not reaching the margin, anterior branch of the third vein slightly curved, obliquely ascending, outer edge of the discal cell deeply angulate, a distinct bristle present at the base of the costa.

One male, three females. May; Austin, Texas.

Empis labiata Loew.

Cent. i, 33.

Male.—Eyes contiguous. Proboscis long, slender; labium very slender, the labellæ filiform, equal to the stipes. Palpi yellow. Antennæ black. Thorax cinerascens with sparse pollen, moderately shining. Hypopygium moderate, porrect, black; the lower lamellæ incurved, with short pubescence and paler towards the apex. Legs black or dark brown, long, slender, with black pile and bristles, all the metatarsi lengthened. Halteres fuscous or blackish, the knob pale above. Wings brownish black, the stigma and veins more dusky; the third

longitudinal vein thick, reaching the margin a little before the extreme apex of the wing, its anterior branch ascending straight to the margin; the fourth vein incomplete.

Female.—The apex of the wing broader than in the male, the third longitudinal vein extending further past the apex of the wing; the discal cell a little larger; the legs with short pile, but the posterior femora and tibiæ with scales on both sides. 3 mm. or larger.

District of Columbia (Osten Sacken).

***Empis distans* Loew (Fig. 127).**

Cent. viii, 54.

Female.—Black. Antennæ black, slender, rather long. Proboscis black, labrum testaceous towards the apex, reaching the middle coxæ, labellæ linear. Thorax blackish gray, opaque, provided with faint black vittæ and sparse black pile; the pile in front of the halteres long, black. Abdomen purer black, shining, with very short black pile. Legs slender, almost black; anterior tibiæ, except the base, and the middle and hind femora on both sides pennate, the middle and hind tibiæ above likewise pennate, below ciliate with ordinary, very short hairs. Halteres dusky yellow, almost fuscous. Wings blackish, the costal and marginal cells darker, veins black; the third longitudinal vein thicker than the others, far distant from the costa, to which it sends an almost perpendicular branch, so that the second submarginal cell forms an equilateral triangle; discal cell rather large; the fourth longitudinal becoming more slender from the base of the discal cell, and slightly reflexed towards the tip. 3.3 mm.

Georgia (Poepig, Berlin Museum). Numerous specimens from Connecticut and Louisiana.

The male has a small gaping hypopygium which is higher than the abdomen, central filament slender, bowed, the tip concealed, middle lamellæ rather large, the right one terminated by a peculiar downward-hanging membranous appendage, upper lamellæ inflexed. Legs not pennate, but sparsely bristly, the bristles becoming long on the outer edge of the hind tibiæ, middle metatarsi as long as their tibiæ, tarsi not spinose below.

***Empis dolorosa* Wheeler et Melander (Fig. 128).**

Biol. Cent. Am., Dipt. Suppl., Nov., 1901, p. 370.

Male.—Black. Eyes closely contiguous, with an acute angular emargination on each side of the face above. Face shining black. Antennæ black, about as long as the head; second joint more than half the length of the first; third joint longer than the first two together, narrowed on the distal half or more; style slender, about half as long as the third joint. Proboscis black, as long as the head and thorax together. Mesonotum very slightly dusted with white, shining; hair and bristles not abundant, black. Pleuræ whitish-pollinose. Four anterior femora and the middle tibiæ and tarsi luteous-yellow; front tibiæ and tarsi and the hind legs darker brown or blackish; metatarsi not dilated; legs provided with rather sparse hairs. Wings somewhat broad, varying from brown-

ish to hyaline, with an elongated inconspicuous brown stigma; discal cell short; the penultimate section of the fifth vein much shorter than the ultimate section; furcation of the third vein acute; fourth vein abbreviated, not reaching the margin. Knob of halteres black. Abdomen scarcely shining. Hypopygium small, filament yellow, thick, with its tip concealed. 5 mm.

Guerrero, Mexico (Smith).

Empis triangula Coquillett.

Proc. Wash. Acad. Sci., 1901, p. 410.

Black, the halteres and legs dark brown, knees yellow, this color rarely extending over the greater portion of the femora and sometimes of the tibiae, venter of abdomen of female largely yellow; eyes of male contiguous, third joint of antennae nearly linear, at least five times as long as broad, the style scarcely perceptible; proboscis from one and one-half to twice as long as height of head; hairs and bristles of thorax and scutellum black; thorax somewhat polished, very thinly gray pruinose, not distinctly vittate, scutellum bearing ten marginal bristles; abdomen slightly polished, hypopygium rather large, obliquely ascending, the lower piece bearing a cluster of rather long, black bristles at its apex, filament hidden, venter of abdomen destitute of processes and of spinous bristles; legs simple, slender, almost bare; wings hyaline, veins and stigma brown, second submarginal cell somewhat triangular, pointed at its base, about one and one-half times as long as broad, discal cell subequal in length to last section of fourth vein, last section of fifth vein half as long as the preceding section. 2-3.5 mm.

British Columbia; Alaska: Tip of Last Vegas Range (Hudsonian Zone), New Mexico (T. D. A. Cockerell).

Empis cormus Walker.

List Dipt. Ins., iii, p. 496.

Black (male), or cinereous (female). Lip, eyes and feelers black; chest of the female adorned with three indistinct hoary stripes; hind borders of the abdominal segments of the female hoary; legs black; knees tawny; shanks and feet piceous; wings colorless, rather broad; wing-ribs and veins piceous, the latter strongly marked; poisers piceous. 4 mm.

Hudson's Bay, St. Martin's Falls, Albany River (Barnston).

A mutilated specimen from Colorado may belong here.

Empis luctuosa Kirby.

Empis luctuosa Kirby, N. A. Zool. Ins., 311, 2.

Empis geniculata Kirby, ibid.

Body entirely black. Proboscis very little longer than the head; wings a little embrowned, with a large black stigma, iridescent, nervures black. Length of body including wings 6 mm.

British America.

E. geniculata Kirby.—Almost black. Wings slightly embrowned, beautifully iridescent; legs, where the shank is united to the thigh, white. Proboscis nearly as long as the thorax. Length 6 mm.

British America.

The synonymy is Mr. Coquillett's, and likewise the introduction of the species into the analytical table is done on Mr. Coquillett's authority for the number of scutellar bristles.

Empis gulosa Coquillett.

Proc. Nat. Mus., 1895, p. 408.

Female.—Head black, bluish gray pollinose; antennæ black, third joint broad at the base, rapidly tapering toward the apex, style slender, more than one-half as long as the third joint; proboscis one-half longer than the height of the head, palpi brown. Thorax black, opaque gray pollinose, marked with four dark brownish vittæ; its very sparse pile black; pleura black, bluish gray pollinose, pile in front of the halteres black; scutellum black, grayish pollinose, bearing four bristles. Abdomen black, opaque brownish pollinose, that on the hind and lateral margins of the segments light gray; on the hind margin of the first three segments toward the sides is a fringe of rather long black bristles, most developed on the second segment. Legs slender, simple, yellow, including the coxæ; tarsi towards the apex brown; femora destitute of long bristles; middle metatarsi slightly thicker, but shorter than the front ones; hind metatarsi much thicker than the middle ones, subequal in length to the front ones. Knob of the halteres yellowish white. Wings grayish, stigma nearly obsolete, veins dark brown, no long bristles on the costa near its base. 7 mm.

Illinois (Robertson).

Empis humile Coquillett.

Proc. Nat. Mus., 1895, p. 403.

Male.—Head black, gray pollinose, except on oral margin; eyes separated a shorter distance than the width of the lower ocellus, facets of a uniform size; antennæ having the two basal joints brownish yellow, the third black, rather narrow, gradually tapering to the tip, style over one-half as long as the third joint; proboscis from two to three times as long as the height of the head, palpi light yellow. Thorax, pleura and scutellum black, opaque grayish pollinose, the rather long pile of thorax and scutellum black; thorax with two blackish vittæ, scutellum bearing four bristles. Abdomen black, shining, the pile rather long and abundant, black; hypopygium large, lamellæ largely yellow, middle ones oblong, slightly tapering to tip, not longer than the broad upper ones; filament slender, almost bristle-like, arcuate. Legs simple, rather robust; coxæ black, femora brownish yellow, lighter yellow at the base, tibiæ and tarsi light yellow, tarsi brownish towards apex; middle and hind legs provided with rather long, stout, black bristles; front and hind metatarsi subequal in size, the middle metatarsi considerably more slender and only two-thirds as long as either of these. Knob of halteres yellow. Wings brownish gray, costal cell and border to some of the veins yellowish; stigma and veins brown.

Female.—Same as the male, with these exceptions: prothorax, the lateral margins of the thorax, the scutellum, metanotum, pleura and abdomen yellowish, a black spot above the middle and hind coxæ, a transverse one on the lower part of the metanotum and sometimes a brownish fascia near or on the hind margin

of each abdominal segment except the first. Coxæ and legs yellow, hind metatarsi much thicker than the front ones. 7 mm.

Illinois (Robertson).

***Empis pœciroptera* Loew.**

Cent. i, 31.

Female.—Yellow, black-pilose. Head yellow. Proboscis yellow, about equal to twice the length of the head. Antennæ long, slender, yellow, the upper margin and the apex of the third joint black. Thorax opaque. Abdomen shining. Legs long, slender, pale yellow, the apex of the tarsi black. Halteres yellow. Wings long, subcinerascens, with a luteous tinge, veins fuscous, the transverse veins bordered with fuscous; the anterior branch of the third vein joined with the second vein by a cross-vein. 4.1 mm.

New York (Edwards).

***Empis longipes* Loew.**

Cent. v, 51.

Male.—Slender, rather bare, yellowish, darker above. Head black, cinereous with whitish pollen. Front very narrow. Antennæ very slender, black, the terminal style moderate. Proboscis about equal to the first two joints of the front tarsi taken together. Thorax lutescent; the dorsum cinereous, opaque, with four narrow fuscous vittæ, the middle ones abbreviated posteriorly, the outer ones much shortened anteriorly, provided with very sparse black bristles and short hair. Scutellum lutescent. Abdomen luteous, shining, with a median vitta on the posterior blackish margins of each segment. Hypopygium moderate, yellow, open, the apex with black hairs, the central filament very thick, concolorous, hidden beyond the base. Legs long, slender, yellow, with short black pile, tarsi piceous, the first joints apically, the others wholly black. Wings yellowish cinereous, veins brownish yellow, stigma concolorous, nearly wanting. 5.5 mm.

New York, Lake George (Osten Sacken).

One female, Alleghany, Pennsylvania, differs from Loew's description of the male as follows:

Basal joints of the antennæ fuscous; the third a little longer than the other two together, its style moderately thick, one-half the length of the third joint; proboscis longer than the hind femora, fulvous on the basal half above; no median vitta on the greatly shining abdominal segments, which are distinctly margined with black posteriorly and laterally; hind trochanters beneath and tip of the femora narrowly black. The outer branch of the third vein is obtusely angulate at its middle, the basal angle of the second submarginal cell being about 70 degrees.

***Empis sordida* Loew.**

Cent. iii, 29.

Male.—Pale tawny, opaque. Head cinereous. Proboscis shorter than twice the length of the head. Basal two joints of the antennæ fuscous, the outer black. Eyes separated. Dorsum of the thorax with four fuscous vittæ, provided with short black pile. Abdomen pale yellow, shining, the base of each segment

fuscous. Hypopygium concolorous, small, clavate, closed, the middle lamellæ ascending, oblong-ovate, with very short pubescence. Coxæ pale testaceous, black pilose. Legs long, slender, testaceous, black pilose; apex of the tibiæ fuscous; anterior tarsi black, except the base; the last joint of the posterior tarsi black. Halteres yellowish. Wings long, subhyaline, cinerascens, faintly tinged with fuscous, stigma obsolete, veins fuscous. 3.5 mm.

District of Columbia (Osten Sacken).

Empis abeirus Walker.

List Dipt. Ins., iii, p. 494.

Male.—Fulvous, hoary. Head hoary, thinly clothed beneath with black hairs; hypostoma black; lip tawny for more than half its length, black thence to the tip, nearly as long as the body; eyes bright red; feelers black; first and second joints dark tawny; chest and breast hoary with a tawny tinge; chest adorned with four gray stripes, between which are rows of short black bristles; the hinder border of the chest is beset with longer black bristles; abdomen black shining; legs tawny, beset with short black hairs and bristles; hips black; feet piceous towards the tips; foot-cushions and claws tawny; wings colorless; wing-ribs and poisers bright tawny; veins piceous, tawny towards the base and along the fore borders. 5 mm.

Georgia (Abbot).

Empis eudamidas Walker.

List Dipt. Ins., iii, p. 493.

Male.—Fulvous, head cinereous, narrower than the thorax, clothed with short black hairs; eyes red; mouth tawny, with a black tip, as long as the chest; feelers tawny, black towards their tips, longer than the head; chest paler on each side, beset with short black hairs, adorned on the back with four gray stripes; abdomen fulvous, apically black; legs tawny, clothed with short black hairs; hips and trochanters gray; knees black; tips of the feet piceous; a short black stripe on each of the four front thighs; wings nearly colorless, tawny towards the base. 6 mm.

Empis amytis Walker.

List Dipt. Ins., iii, p. 493.

Male.—Fulvous. Head black, much narrower than the chest; eyes dark red; mouth tawny, with a black tip, much shorter than the chest; feelers black; chest and breast tawny; disc of the former black; abdomen black, dull, tawny along each side; legs tawny, clothed with short black hairs; knees and tips of feet black; wings colorless; wing-ribs and poisers tawny; veins piceous, tawny towards the base. 5 mm.

New York.

Empis olius Walker.

List Dipt. Ins., iii, p. 493.

Female.—Fulvous. Head gray, thinly coated beneath with black hairs; hypostoma black, shining; lip dark tawny, piceous at the tip, shorter than the body; eyes bright red; feelers black; chest and breast dull tawny; chest adorned with four brown stripes, between which are rows of short black bristles; the hinder

part of the chest is beset with longer black bristles; abdomen black, shining, legs tawny, beset with short black hairs and bristles; hips black; feet piceous towards the tips; wings slightly tawny; wing ribs and poisers bright tawny; veins piceous, tawny towards the base and along the fore borders. 4 mm.

Nova Scotia.

***Empis laniventris* Escholtz.**

Wiedemann, *Aussereurop.* Zweifl. Ins., 2, p. 6.

Fuscous; head black; thorax in front and abdomen with yellow hair. Head below wholly bare; occiput with long black hairs. Eyes brown. Antennæ black, the first two joints with hairs at their tips only. Proboscis black; palpi yellow. Thorax grayish brown, with brown hairs on the dorsum, on the pleuræ with longer yellow hairs. Scutellum grayish brown, with a few black bristles. Pectus grayish brown, with no hairs. Abdomen above dark brown, with fine black pubescence; venter in the middle and plainly on the sides with long, dense yellow hairs. Wings much longer than the body, somewhat yellowish, with brown veins, those nearest the costa wholly yellow; the anterior branch of the third vein strongly arcuate. Knob of the halteres yellow, the pedicel brown. Legs reddish brown, with piceous tarsi, with fine black hairs; hind tibiæ bowed; femora scarcely thicker than the tibiæ. 8 mm.

Alaska. Bering Isl.

***Empis colonica* Walker.**

List Dipt. Ins., iii, p. 498.

Body bright tawny, shining, smooth, beset with a few slender short black bristles; eyes and feelers black; lip tawny piceous towards the tip, much more than half the length of the body; abdomen dark tawny, thinly clothed with short black hairs and bristles; feet piceous towards the tips; wings with a tawny tinge; wing-ribs tawny; veins brown, tawny towards the base; poisers pale yellow. 6 mm.

Nova Scotia (Redman).

***Empis leptogastra* Loew.**

Cent. iii, 30.

Female.—Slender, yellow, shining, rather bare. Head black, face and front very narrow, concolorous; antennæ slender, elongate, the third joint black, the preceding fuscous. Proboscis slightly longer than the head, slender, yellow. Dorsum of the thorax divided by a longitudinal black median vitta. Abdomen marked with a basal black fascia on each segment, united by a black line, the last segment black altogether. Legs with sparse fine pile, slender, the hind femora thickened towards the apex and bearing black spines below; the apex and a median ring of the hind femora, the apical third of the hind tibiæ and all the tarsi black. Knob of the halteres infuscated. Wings rather long and narrow, cinereous hyaline, veins piceous, the third vein slightly incurved apically, the anterior branch ascending perpendicularly. 4.5 mm.

District of Columbia (Osten Sacken).

***Empis armipes* Loew.**

Cent. i, 32.

Male.—Yellow, with short black pile. Eyes distant. Proboscis yellow, longer

than the head. Palpi yellow. First two joints of the antennæ yellowish brown, the third joint black, long, strongly attenuate from the broad base, the terminal style long. Thorax opaque, a single fuscous vitta, abbreviated from each side and sometimes obsolete. Abdomen shining, fuscous, the side and hind margins of each segment yellow. Venter yellow. Hypopygium small, porrect, the middle and lower lamellæ yellow; the central filament almost concealed. Legs long, slender, yellow, the tarsi from the apex of the first joint almost black; the posterior legs with the femora armed with some very obtuse spines, a part large and black-pilose, the others smaller and bare. Halteres yellow. Wings long, brownish gray, the faint stigma a little more brown, veins fuscous.

Female.—Very much like the male; the posterior legs simple; the pile of the tibiæ and tarsi shorter and sparser than in the male. 5 mm.

New York.

Empis tridentata Coquillett (Fig. 132).

Proc. U. S. Nat. Mus., vol. xxiii, p. 609.

Head black, gray pruinose, front of male at narrowest point less than the width of the lowest ocellus; antennæ black, the first two joints yellow, the third slightly over four times as long as wide, gradually tapering to the apex, nearly four times as long as the style, palpi and proboscis yellow, the latter almost twice as long as the height of the head; thorax yellow, a large black, gray pruinose spot in the middle of the hind part of the mesonotum; sending three prongs toward the head, the median one subopaque, the lateral ones polished, three small black spots beneath the insertion of each wing, and a fourth bordering the mesothoracic spiracle and prolonged backward almost to the wing, hairs and bristles of thorax black, scutellum yellow, the base of the middle black, bearing four bristles; abdomen polished, yellow, bases of segments two to four or five usually black, most extended in the female, central filament of male hypopygium very sinuose; legs yellow, apices of tarsi brown, middle and hind femora beset with spinous bristles on the under side; wings hyaline, stigma brown, a brown cloud on the base of upper branch of third vein, another on vein at base of second posterior cell, and one above forking of second and third veins. 6 mm.

Pennsylvania (C. W. Johnson).

Empis pallida Loew.

Cent. i, 30.

Male.—Wholly yellow. Head concolorous. Eyes separated. Proboscis much longer than the head. Antennæ long, slender, first two joints yellow, third, except the base, black, with a slender terminal style. Thorax opaque, sparsely black-pilose. Abdomen shining, covered with rather long yellowish pile. Hypopygium small, clavate, the median lamellæ oblong-ovate, ascending, with short pile. Coxæ yellow, with black pile. Legs long, slender, yellow, with black pile; last joint of the tarsi wholly, the others apically black. Halteres yellow. Wings large, hyaline, pale cinerascens, with a yellowish tinge, stigma pale yellow, almost wanting, veins yellow. 4 mm.

New York (Edwards).

Empis rufescens Loew (Fig. 120).

Cent. v, 52.

Male.—Yellow, reddish above. Thorax subopaque, abdomen shining. Head black, cinereous with whitish pollen. Eyes narrowly separated on the front. Antennæ moderate, rather stout, the first two joints red, the third black, the terminal style moderate. Proboscis yellow, longer than the front tibiæ. Dorsum of the thorax provided with a few black hairs and bristles. Hypopygium yellow, rather long, ascending, closed, the lower lamellæ long, the upper small, short-ovate, the central filament exerted, low, slender, curved, yellow. Legs slender, clothed with short black hairs and setulæ, yellow, the first two tarsal joints apically and the other three wholly black. Wings cinereous with a yellowish tinge, veins fuscous, becoming luteous towards the costa and base, stigma very pale, subfuscous. 6.1 mm.

New Hampshire (Osten Sacken). Massachusetts (Hough).

Empis rubida Wheeler et Melander (Fig. 121).

Biol. Cent. Am., Dipt. Suppl., p. 368, Nov., 1901.

Female.—Front and face shining black. Antennæ reddish yellow; third joint slender on the distal part, the style slender, aristiform. Proboscis yellow, not longer than the head. Mesonotum shining, yellowish red, strongly convex; bare; pleuræ yellower. Abdomen brownish yellow. Legs light yellow, not dilated or ciliated; tip of all the metatarsi and the remaining tarsal joints, the tips of the hind femora and tibiæ blackish. Wings cinereous hyaline, with yellowish veins; stigma elongate, brown; anterior branch of the third vein nearly rectangular and gently arcuated. Halteres yellow. 4 mm.

Guerrero, Mexico (Smith).

Empis otiosa Coquillett (Fig. 122).

Proc. Nat. Mus., 1895, p. 407.

Male.—Head black, gray pollinose, eyes separated as widely as the posterior ocelli, facets of a uniform size; antennæ black, third joint two and one-half times as long as the first, rather narrow, style one-third as long as the third joint; proboscis two and one-half times as long as the height of the head, palpi yellow. Thorax black, opaque gray pollinose, marked with two darker vittæ, its sparse pile and bristles black; pleura black, gray pollinose, its pile black; scutellum gray pollinose, bearing four bristles. Abdomen black, depressed, except towards apex, subshining, its pile rather abundant and long, black; hypopygium rather small, middle lamella longer than the upper, rounded on the lower side; filament rather slender, yellow. Legs simple, very robust, femora nearly twice as thick as their tibiæ, hind femora one-third longer than the middle ones; coxæ black, femora dark brown, yellowish at base and apex, the hind ones sometimes wholly yellowish, tibiæ and tarsi light yellow, apex of the latter brown; front metatarsi unusually large, nearly twice as long and as thick as the middle ones, one-half thicker and one-third longer than the hind ones. Knob of halteres light yellow. Wings hyaline, stigma pale brownish, veins dark brown.

Female.—Same as the male, except that the tibiæ and tarsi are darker, the yellow being replaced with reddish; the femora are usually reddish and are more slender; the hind ones are nearly twice as long as the middle ones; front meta-

tarsi more slender and one-half longer than the middle ones, also more slender and slightly longer than the hind ones; wings grayish brown. 6-7 mm.

Illinois, Connecticut; Massachusetts, New Hampshire, Kansas, Louisiana.

***Empis Johnsoni* sp. nov. (Fig. 123).**

Male and Female. Length 6 mm.—Black, head and thorax closely covered with grayish tomentum, the gray color with a slight brown tinge. Eyes maroon color, of the male contiguous for two-thirds the distance between the front ocellus and the antennæ; of the female the eyes are separated more widely than the posterior ocelli; face short, broad, cinereous-dusted, oral border shining black, cheeks obliterated, mouth-opening large; palpi short, extending straight forward, but not surpassing the oral border, luteous, with a slender black sub-apical bristle; proboscis slender, extending to the tip of the middle coxæ, yellow above, black below; antennæ shorter than the head-height (male), or subequal to it (female), first two joints short, fuscous, the third elongate, lanceolate, black, blunt at the tip in the female, the arista one-half the length of the third joint in the male, or more slender and only one-third the length in the female; occiput cinereous, its black bristles in two rows, moderately bristly below. Thorax cinereous, dorsum with two narrow darker stripes, and two broader posteriorly placed lateral ones; between the median and lateral vittæ a distinct series of black bristles, humeri with a bunch of hairs, dorsum margined with about eight prominent macrochætæ on each side, scutellum with four long marginal, and no short bristles, the row in front of the halteres dense, with about fifteen bristles, no other pleural bristles, pectus with a few scattered short bristles. Abdomen depressed, shining, very faintly cinereous toward the base in the female and opaque jet black in the male on the basal four segments, which are rather densely provided with long black marginal hairs; hypopygium shining, compressed, rather large, distinct, porrect, central filament yellow, slender, arcuate, largely visible, middle lamellæ large, pointed, porrect, fulvous on the lower side, upper lamellæ small, bipartite, fulvous, except the darkened upper edge. Coxæ black, faintly slaty-gray pollinose, with numerous black bristles, remainder of the legs fuscous, becoming darker on the outer half of the tarsi; legs slender, unarmed, hind femora below with evident spines, legs with numerous bristles and short black hairs; pulvilli and claws of male large. Halteres fuscous. Wings sub-hyaline, with a brownish tinge, stigma almost obsolete, veins strong brown, third vein furcate beyond the tip of the marginal cell, the anterior branch arises acutely, the posterior branch terminates just before the extreme wing-tip, first submarginal cell narrower than the first posterior cell, sixth vein recurved at the tip, costa with a strong bristle at its base.

Four specimens; Montgomery County, Pennsylvania (C. W. Johnson).

***Empis enodis* sp. nov. (Fig. 125).**

Male and Female. Length 6-8 mm.—Almost bare species of moderate stature. Black, cinerascens with olivaceous gray. Head cinerascens, eyes wine color, separated at their narrowest part in the male as widely as the posterior ocelli, in the female a trifle more; palpi very small, reddish; proboscis once and one-half

to two times the height of the head, black above, reddish below, labella black; antennæ black, slender, as long as the head, second joint one-half the length of the first, first and second joints with sparse hairs, third joint lanceolate, somewhat blunt in the female, arista one-third the length of the third joint; the strong bristles of the occiput in two rows. Thorax brownish gray cinereous, the brown more evident on the dorsum, with four broad brown vittæ, the intervittal spaces with short hairs, those of the median series minute, a few long marginal macrochætæ on the dorsum; scutellum with four to six marginal bristles of uneven length, the central pair longest; metapleural row consisting of about five closely-placed nearly uniform bristles; prothoracic series small, no pectal or other pleural bristles. Abdomen concolorous with the pleuræ, devoid of long hairs, almost glabrous, except towards the tip, with strong bristles near the incisures; hypopygium small, not extending above the abdomen, closed, central filament hidden, or sometimes the trumpet-shaped tip more or less exposed, middle lamellæ small, rounded, fulvous, upper lamellæ small, nearly hidden. Coxæ cinerascens, apically more or less fuscous, provided with a few bristles, those of middle and hind legs in series, trochanters with a minute black spot; legs simple, fuscous, femora narrowly tipped with black, tarsi black, legs with small bristles, becoming short and dense on the hind tibiæ of the male, and on the under side of all the tarsi of both sexes, and long on the tibiæ, sparsely so on the front and middle ones, and more numerous on the hind ones of the male; none of the metatarsi or tibiæ thickened; pulvilli minute. Halteres reddish. Wings hyaline, with a smoky tinge, no stigmal spot; veins strong, dark fuscous, discal cell rather deep, the first section of its anterior border one-fourth the length of the second section; the furcation of the third vein even with the tip of the marginal cell, the posterior branch terminates beyond the tip of the wing.

Glen Ellyn and Chicago, Illinois.

***Empis stenoptera* Loew.**

Cent. v, 50.

Slender, almost glabrous, opaque, whitish cinerascens, abdomen of female less whitish. Head concolorous. Eyes of the male separated. Antennæ very slender, black. Proboscis black, longer than the head, but shorter than the anterior femora. Dorsum of the thorax quadrivittate with subfuscous, the median vittæ abbreviated posteriorly, the outer anteriorly. Hypopygium of the male closed, black, the lower lamellæ testaceous, the central filament hidden. Coxæ whitish cinerascens, pale yellowish apically. Legs slender, fuscous, the base of the femora, and the base of the tibiæ broadly below, yellow, the tibiæ towards the tip and all the tarsi black. Halteres pale yellowish. Wings narrow, cinereo-hyaline, stigma obsolete, veins fuscous. 4 mm.

New Hampshire (Osten Sacken).

***Empis cacuminifer* sp. nov. (Fig. 124).**

Male and Female. Length 6 mm.—Dusky opaque species. Head, pleuræ, metanotum and large part of the abdomen dark plumbeous gray-pollinose; thoracic dorsum broadly quadrivittate with brown. Palpi fuscous, without hairs; proboscis one and one-half times the head-height or less, dark reddish, the labella shorter than the proboscis. Antennæ as long as the head, slender, black, the first joint twice as long as the second, the third joint not quite three times

the length of the first, lanceolate, its arista one-third its length; eyes separated a little more widely than the posterior ocelli in the male, and a little more in the female; bristles of the occiput irregularly placed. The intervittal bristles of the thorax minute, the marginal macrochætæ short, no long humeral macrochætæ; scutellum with two long and two short marginal bristles; three or four bristles in the vertical row in front of the halteres; bristles of the pronotal collar minute, no pectal bristles present. Abdomen dull grayish, with a piceous tinge, wholly opaque, the hind margins of the segments cinereous; hypopygium moderate in size, closed, central filament rather stout, nearly straight on the exposed basal part, fuscous, shining, middle lamellæ concealing the remainder of the hypopygium, dark fuscous. Legs stout, dark fuscous, including the coxæ, tarsi blackish; coxæ sparsely black-bristly, more evidently bristly in front; tip of trochanter and of femora narrowly black; hind femora slightly bowed on the proximal third; hind trochanters of the male widened within and produced as a prominent tubercle, which is capped by a dense pencil of black bristles, remainder of the legs without sexual armament; hind femora not reaching the end of the abdomen, as long as or shorter than their tibiæ; front metatarsi of the male a little stouter than those of the female, tarsi densely spinose beneath; bristles of the legs prominent, especially in the male, pubescence not marked. Halteres reddish yellow. Wings hyaline, with a faint brown tinge, veins fuscous, stigma obsolete, third vein furcate opposite the end of the marginal cell, the posterior branch terminates at the wing apex; discal cell moderate, the first section of its fore margin one-fifth the length of the second section, no prominent costal bristle.

Numerous specimens from Ohio (J. S. Hine), and Alabama (C. F. Baker).

***Empis nuda* Loew (Fig. 126).**

Cent. ii, 20.

Male.—Pale cinereous, opaque, almost glabrous. Eyes distant. Antennæ elongate, slender, black. Proboscis moderate. Thoracic dorsum almost bare, with very sparse black bristles and four fuscous vittæ, the middle vittæ abbreviated posteriorly, the outer on both sides. Pleuræ cinereous, bare, except for two black bristles in front of the halteres. Abdomen fusco-cinereous, the hind margins of each segment grayish white. Hypopygium small, yellowish, with sparse black pile, the lamellæ oblong-ovate, the base of the central filament very thick, the apex hidden. Coxæ pale yellow, the anterior bare, except for a few apical setæ. Legs slender, darker yellow; the tarsi and a very narrow apical ring on the hind femora almost black, the base of the tarsi and the apex of the tibiæ paler fuscous; the hind trochanters armed with small black spines below; the black pile of the femora very short, of the middle tibiæ longer, of the hind tibiæ long above. Wings cinerascens, the obsolete stigma pale subfuscous, veins strong fuscous. 6 mm.

Illinois (Le Baron).

The following remarks, based on further specimens also from Illinois, may be of service in the identification of this species.

Eyes separated in the case of the male as widely as the width of the anterior ocellus. The occipital bristles short, arranged in two

rows. All the intervittal spaces provided with sparse minute bristles arranged longitudinally. The row in front of the halteres consists most generally of three bristles. Scutellum with two bristles. The abdomen is slightly shining through the sparse coating. The hind femora possess a single short spine-like bristle at the beginning of the outer third of the lower surface; front metatarsi as thick as the outer part of the tibia, and nearly as long as the three following joints. Halteres pale yellow. Stigma wanting, the third vein acutely branched at the tip of the marginal cell, its anterior branch scarcely two thirds the length of the posterior branch, which ends at the extreme wing tip; the proximal section of the vein bounding the discal cell anteriorly scarcely one third the length of the second section.

The female differs from the male in that the eyes are separated a little more widely, the posterior trochanters lack the pencil and are not explanate, the hairs of the legs are all short and evidently bristle-like, and the front metatarsi are slender.

***Empis compta* Coquillett.**

Proc. Nat. Mus., 1895, p. 405.

Female.—Head black, gray pollinose; two basal joints of antennæ brown, the third black, narrow, elongate, style one-sixth as long as the third joint; proboscis over twice as long as the height of the head, palpi brown. Thorax and pleura black, opaque gray pollinose, thorax marked with four blackish brown vittæ; pile in front of halteres black; scutellum blackish, its apex brown, bearing four bristles. Abdomen on base of segments yellowish brown, on apex broadly yellow, seventh and eighth segments and the two anal lamellæ wholly brown; pile of abdomen sparse, yellowish, no fringe of long black bristles on the hind margin of any of the segments. Legs slender, destitute of a fringe of scales, yellow, including the coxæ; tarsi toward the apex brown; metatarsi of nearly an equal thickness, the hind ones slightly longer than the others. Knob of halteres light yellow. Wings hyaline, stigma wanting, veins light brown, no stout bristle on costa near its base (first marginal cell closed in one wing, broadly open in the other). 3.5 mm.

Illinois (Robertson).

Male.—Beyond the fifth abdominal segment the abdomen is suddenly bent downward, the seventh dorsal segment convex, small; hypopygium moderately large, hanging downward, almost cylindrical, tubular, the lamellæ porrect, moderately prominent, yellowish, the central filament reddish, hidden within the tube. Legs slender, unarmed, the hind femora beneath and the tibiæ outwardly with a few slender, black longer hairs. Wings slender, rather pointed, the first submarginal cell open, the anterior branch of the third vein bent, extending acutely.

Opelousas, Louisiana, March.

Empis varipes Loew.

Cent. i, 34.

Male and Female.—Hunch-backed. Head, thorax and scutellum cinereous, opaque. Proboscis longer than the head, luteous, stripes of the labium black. First two joints of the antennæ dark brown, the third black. Thorax black-pilose. Abdomen black, very shining, sparsely provided with very fine pale pile, the base and venter luteous. Hypopygium of the male very small, dipping down, black, the central filament low and slightly curved. Front coxæ luteous, the others grayish brown. Legs luteous, a very broad subapical ring on the posterior femora black, a very broad subbasal ring on the hind tibiæ fuscous, sometimes wanting, the apex of all the tibiæ fuscous; all the femora below with small black spines. Halteres white. Wings of the male longer than those of the female, whitish, veins concolorous, but the second section of the costa and the apex of the third longitudinal blackish; wings of the female pure hyaline, not whitish, with a very faint cinerascence, veins fuscous. 3 mm.

Pennsylvania (Osten Sacken).

Empis levicula Coquillett.

Proc. Nat. Mus., 1895, p. 406.

Male. Head black, bluish gray pollinose, eyes contiguous; antennæ black, the two basal joints yellow, style over one-half as long as the third joint; proboscis yellowish, black at the apex, over three times as long as the height of the head, palpi yellow. Thorax, pleura and scutellum black, opaque gray pollinose; thorax with four brown vittæ, its sparse pile and bristles black; pile of pleura white, scutellum bearing four bristles, the two outer very short. Abdomen black, opaque brown pollinose, its sparse pile white; hypopygium small, the filament hidden. Legs slender, destitute of long bristles, dark yellowish, including the coxæ; the tarsi toward the apex black; front metatarsi nearly as long, but only about half as thick as the hind ones. Wings whitish hyaline, veins brownish, stigma wanting. Halteres yellow.

Female.—Same as the male, except that the thorax and abdomen are wholly bluish white pollinose. 6-7 mm.

Illinois (Robertson).

Empis avida Coquillett.

Proc. Nat. Mus., 1895, p. 405.

Female.—Head black, bluish gray pollinose; antennæ brown on the two basal joints, the third joint black, short, broad, tapering gradually to the tip, style over one-half as long as the third joint; proboscis three times as long as the height of the head, palpi yellow. Thorax, pleura and scutellum black, opaque, bluish gray pollinose; thorax marked with four blackish brown vittæ, its pile rather dense, but quite short, black; pile in front of halteres white, abundant, fine; scutellum bearing four bristles. Abdomen black, opaque, light bluish gray pollinose, its pile white, that on sides near the base abundant, long; no fringe of long black bristles near the hind margins of any of the segments. Legs slender, simple, femora destitute of long bristles; coxæ brownish yellow, the hind ones largely blackish; femora, tibiæ and tarsi brownish yellow, apices of tarsal joints and last joint wholly blackish; middle metatarsi scarcely thicker than the front ones,

hind metatarsi nearly twice as thick but scarcely longer than the front ones. Knob of halteres yellowish white. Wings grayish hyaline, stigma and veins dark brown, no long bristle on costa near its base. 7 mm.

Illinois (Robertson).

Empis comantis Coquillett.

Proc. Nat. Mus., 1895, p. 402.

Male.—Black; apex of palpi, proboscis, except the base and the lower lip, femora, except a large portion of the under side, tibiae and tarsi, except at apex, yellowish red. First antennal joint twice as long as the second; the third one and one-half times as long as the first; style slender, as long as the third joint; frontal triangle naked; eyes narrowly separated; proboscis three times as long as the height of the head. Thorax opaque gray pollinose, marked with four blackish vittae, thickly white and black pilose, the bristles black; pile at each end of pleura, on coxae and abdomen mixed black and white; that on venter and sides of abdomen abundant, white. Scutellum white pollinose, and bearing twelve marginal black bristles. Abdomen shining, nearly destitute of pollen; hypopygium large, ascending; central filament largely yellow, double, free, arcuate. Legs simple, femora thickened, the hind ones over twice as thick as their tibiae; pile and bristles of femora rather numerous and long. Wings slightly brownish, stigma and a spot above base of second vein, dark brown, anterior branch of third vein very oblique and much curved. 9 mm.

Northern California (O. T. Baron).

The knobs of the halteres are black.

Empis brachysoma Coquillett.

Proc. Wash. Acad., 1901, p. 409.

Black, the palpi, horny portion of proboscis, stems of halteres, femora and tibiae yellow, front and hind femora in both sexes and hind tibiae in the male, yellowish brown, coxae brown basally, changing into yellow at their apices, tarsi and knobs of halteres dark brown, apex of male abdomen marked with yellow; eyes of male contiguous, third joint of antennae rather broad at base, quite rapidly tapering to the apex, about twice as long as the style, proboscis twice as long as height of head; hairs and bristles of mesonotum black, hairs of pleura and abdomen white; thorax opaque, gray pruinose, mesonotum marked with four slightly polished, black vittae, scutellum bearing from four to six black bristles; abdomen of male polished black in middle of dorsum, the sides opaque, gray pruinose; in the female the dorsum of segments two to four, and all of abdomen beyond fifth segment polished black, remainder of abdomen opaque, gray pruinose; hypopygium of male rather small, obliquely ascending, claspers destitute of processes, dorsal piece with a broad emargination in the posterior end almost reaching its center, central filament hidden, venter destitute of processes and of spinous bristles; legs of male simple, femora destitute of bristles and long hairs; first joint of hind tarsi noticeably thicker than that of the front ones; legs of female ciliate with nearly erect scales on both sides of the hind femora and tibiae, middle femora, and apical half of upper side of the front femora; wings unusually long and narrow, grayish hyaline, stigma and veins, except at base of wing, dark brown, venation normal. 7 mm.

Alaska.

***Empis obesa* Loew.**

Cent. i, 28.

Male.—Cinereous, opaque. Eyes contiguous. Proboscis slender, nearly equal to the body. Palpi yellow. Antennæ black. Dorsum of the thorax with four black vittæ covered with fine whitish hairs and a little longer black pile. Margin of the scutellum with black bristles. Abdomen white-pilose. Hypopygium large, swollen, ascending; lamellæ obtuse at apex, the upper wholly badious; the central filament high and very thick. Coxæ cinereous, badious at the very tip, clothed with pale hairs and a few black bristles. Legs slender, simple, badious, black-pilose; anterior tibiæ apically and the posterior all but the base dark brown; tarsi black. Halteres luteous. Wings infuscated, veins and stigma dark fuscous, the discal cell moderate, the anterior branch of the third vein very oblique. 3 mm.

Massachusetts (Scudder).

***Empis Aldrichii* sp. nov. (Fig. 110).**

Male. Length 7.5 mm.—Head and thorax black, gray pollinose, abdomen fulvous or partly black. Front and face gray pollinose; eyes separated as widely as the width of the anterior ocellus, facets small, of uniform size; face of even breadth, sides of the front rounded inwardly, anterior oral margin black, shining; occiput gray pollinose, black-bristly above, the bristles arranged as a postocular row and scattered beyond this, with fine hairs intermixed; on the lower occiput the hairs are white; proboscis three times the length of the head. fulvous, the labella black; palpi ribbon-like, pale lemon-yellow, rectangularly bent at their middle; antennæ as long as the face and front together, slender, the first two joints yellowish, the third black, the second joint one-half the length of the first, the third joint as long as the first and second united, gradually acuminate, with a rather slender style one-third its length; not conspicuously hairy. Thorax gray pollinose, the pollen without any bluish tinge, but merging towards olive-brown instead; tip of the humeral callosity red, shining, subhumeral spiracle large, yellow; on the middle of the pectus above each of the front coxæ is a conspicuous rosette of yellowish hairs, in front of the halteres is a row of many fine yellowish hairs; dorsum of the thorax opaque brown-gray pollinose, provided with four chocolate-brown broad vittæ, the middle pair abbreviated posteriorly on the concave portion of the mesonotum, the outer pair abbreviated anteriorly; humeri with a few short blackish bristles, sparser on the notum, intervital spaces provided with scattered short, fine yellowish hairs, the margin of the notum with several black bristles, scutellum with four marginal bristles, an extra pair of small ones present rarely; the intervital black bristles become longer in front of the scutellum. Abdomen robust, as long as the head and thorax united, cylindrical, not shining (or at least but little shining on the rubbed parts), closely covered with pollen, gray basally, becoming fulvous on the remainder of the abdomen, the segments rather conspicuously provided with luteous hairs; the ground color of the abdomen is piceous, with the posterior margins of the segments flavescent, the last ventral segment larger, black, dusted or not, provided with a few apical black spurs on the right side; hypopygium robust, more or less spherical, yellowish red, its parts distinct, the filament curved, stout, partly clasped near its middle by the inferior triangular lamellæ. Legs moderate, sim-

ple, reddish yellow; coxæ grayish basally, with whitish hairs on the antero-exterior side, trochanters with a faint blackish spot below near the tip; femora a little thickened; metatarsi about equal in thickness, slender, front and hind ones of the same length, middle ones a little shorter; last tarsal joint blackish; legs clothed with very fine, dense, short, pale pubescence and with short blackish hairs, longer on the under edge of the femora. Halteres large, yellowish. Wings large, full, dark, no stigma present, anterior branch of the third vein curved, oblique, no large costal bristle.

Two males; Moscow, Idaho, and Mt. Hood, Oregon.

This species differs structurally from *E. ravida* Coquillett in the larger hypopygium, thickened femora, slender tibiae and tarsi, separation of the eyes, and the chaetotaxy, especially of the scutellum, hind femora and coxæ.

Empis ravida Coquillett (Fig. 111).

Proc. Nat. Mus., 1895, p. 403.

Male.—Black, the palpi and halteres yellow, the proboscis, except the lower lip, hypopygium, coxæ (largely or wholly), femora, tibiae and tarsi, reddish yellow. Eyes contiguous, frontal triangle bare. First antennal joint two and one-half times as long as the second, the third joint one and a half times as long as the first, sub lanceolate, the style rather slender, nearly half as long as the third joint. Proboscis twice as long as the height of the head. Thorax opaque, gray pollinose, marked with four brownish black vittæ, the shorter pile whitish, the longer pile and the bristles black. Pile on each end of the pleura, on coxæ, venter and sides of abdomen whitish; middle and hind coxæ bearing black bristles. Scutellum bearing six to eight black bristles. Abdomen opaque, white pollinose, the short pile of the dorsum black. Hypopygium moderately large, obliquely ascending, the central filament not disengaged; no projections on venter in front of the hypopygium; coxæ and legs simple, femora destitute of stout spines below, the bristles very short; wings dark gray, stigma much elongated, dark brown, anterior branch of the third vein oblique and curved.

Female.—Same as the male with these exceptions: eyes widely separated; abdominal segments beyond the fifth shining; apical half of the under side of the hind femora ciliate with rather short scales and spines. 6-8 mm.

New Hampshire (Coquillett); Georgia, Idaho.

Empis captus Coquillett.

Proc. Nat. Mus., 1895, p. 405.

Male.—Differs from the male of *Empis ravida* only as follows: first two antennal joints reddish; first joint only slightly longer than the second, the third three times as long as the first, tapering very gradually to the apex; scutellum bearing only two bristles; dorsum of abdomen brownish pollinose. Hypopygium very large, the filament robust, disengaged, arcuate, compressed and dilated near the apex; on base of upper side of each upper lamella is a low wart-like process, and just outside of this is a backwardly projecting fleshy process bearing on the middle of its under side a backwardly directed black spine whose tip is even with

that of the process from which it springs; below this process is a second, yellow fleshy, upwardly directed process. Wings hyaline.

Female.—Differs from the male in that the proboscis varies from two to four times the head-height; femora and tibiae of middle and hind legs ciliate on each side with rather short, black scales and bristles, the scales sparsest on the middle tibiae. 5-7 mm.

North Carolina and Georgia.

***Empis tersa* Coquillett.**

Proc. Nat. Mus., 1895, p. 404.

Male.—Differs from the male of *Empis ravidus* only as follows: abdomen shining reddish yellow; coxae, femora and tibiae lighter yellowish; first antennal joint twice as long as the second, the third joint twice as long as the first; proboscis three times as long as the height of the head; thorax destitute of whitish pile, that on each side of the pleura black, each coxa bearing several black bristles; pile and long bristles of abdomen and venter wholly black. Scutellum bearing four bristles. Abdomen shining, destitute of pollen. Hypopygium small, porrect; the central filament free, filiform, arcuate. Bristles of middle and hind femora rather long.

Female.—Differs from the male in that the proboscis is six times as long as the height of the head, when bent backward almost reaching the tip of the abdomen. 6 mm.

North Carolina.

***Empis tenebrosa* Coquillett.**

Proc. Nat. Mus., 1895, p. 404.

Male.—Differs from the female of *Empis ravidus* only as follows: eyes as widely separated as the posterior ocelli. First two antennal joints reddish, the first scarcely longer than the second, the third twice as long as the first. Entire pile of the thorax, pleura, coxae, venter and abdomen black. All the femora robust, twice as thick as their tibiae, the middle and hind ones bearing numerous, rather long bristles on their under side. 6 mm.

Texas.

***Empis spectabilis* Loew (Fig. 109).**

Cent. ii, 21.

Female.—Gray, opaque, with short black pile. Head cinereous. Length of the proboscis nearly twice that of the head. Palpi yellow. Antennae long, the first two joints dark badious and black-pilose, the third joint black, its apical style stout. Thorax quadrivittate with fuscous, the side vittae much abbreviated. Coxae reddish, cinerascens towards the base, black-pilose. Legs rufous, the extreme apex of the femora and the apex of each tarsal joint black, the last tarsal joint wholly black; the hind femora moderately thickened, the middle and hind femora with small black spines below. Halteres yellowish. Wings brownish red, the costal cell ochraceous, veins dark brown, stigma lighter fuscous; discal cell short; anterior branch of the third vein erect. 7 mm.

Maryland (Osten Sacken). Delaware Co., Pennsylvania.

Male.—The hairs of the under side of the palpi are long; the antennal style is not more than one-fifth the length of the third joint; the thoracic vittæ are narrow; the hairs on the base of the costa become longer, with two or three on each side bristle-like. Abdomen stout, deflexed at the tip, the fifth dorsal segment large, convex, provided with a prominent lateral reddish umbo, beneath this the venter is much constricted, the fourth ventral segment large, terminating in a flat transverse bifid process, the fifth and sixth ventrals small, crowded into the constriction, the seventh ventral moderately large; hypopygium small, the central filament thick, its base exposed, middle lamellæ quadrilateral, truncate at the tip, yellowish.

Clementon, New Jersey.

The male has eight long scutellar bristles, the female but four. The eyes of the male are narrowly separated by the front so that they nearly touch (vide Coquillett, *Empidæ*, p. 398, group 23).

It is to the group of the four following species that *Empimorpha barbata* belongs.

***Empis lævigata* Loew.**

Cent. v, 49.

Male.—Wholly black, shining, black pilose. Eyes contiguous. Antennæ slender, black. Proboscis black, partly fuscous above, longer than the anterior tibie. Dorsum of thorax black pilose, very finely covered with cinerascens pollen. Scutellum convex, bare, except for six marginal bristles. Pleuræ and coxæ cinereo-pollinose, subopaque. Hypopygium deflexed, closed, the central filament hidden. In front of the hypopygium the venter has two incurved apophyses bearded with black pile. Legs simple, slender, clothed with short hairs and fine black bristles. Knob of halteres flavescent. Wings pale subfuscous, the stigma subfuscous, veins fuscous. 7.5 mm.

New Hampshire (Osten Sacken).

***Empis virgata* Coquillett (Fig. 108).**

Proc. Nat. Mus., 1895, p. 408.

Male.—Black in all its parts, except the whitish knob of the halteres and the pulvilli; all pile and bristles also black. Eyes separated by an interval narrower than the lowest ocellus; third joint of the antennæ sublanceolate; the style nearly one-fourth as long as the joint. Proboscis slightly over twice as long as the height of the head. Thorax subshining, lightly gray pollinose and marked with three shining black vittæ; pleura grayish black pollinose, scutellum shining, bare, except the six marginal bristles and a few marginal hairs. Abdomen depressed, shining; hypopygium rather small, central filament hidden; on the under side of the fifth segment is a large, ovoid process, extending the entire length of the segment, its posterior end rather thickly beset with short, stout black bristles. Legs slender, front metatarsi one-half thicker and one-half longer than the middle ones, noticeably longer and thicker than the hind ones. Wings pale brown, stigma darker brown, all the veins perfect. 8 mm.

Washington (O. B. Johnson); British Columbia, Alaska.

Empis pellucida Coquillett.

Proc. Wash. Acad. Sci., 1900, p. 408.

Black, the palpi and horny part of proboscis, except at base, yellow, halteres yellowish white, bases of tibiae sometimes reddish yellow; eyes of male more widely separated than the posterior ocelli; third joint of antennæ rather broad, gradually tapering to the apex, about five times as long as the style, proboscis twice as long as the height of the head; hairs and bristles of body and legs black; mesonotum slightly polished, marked with a median, light gray pruinose vitta, the lateral margins and pleura gray pruinose; scutellum bearing four bristles; abdomen highly polished, hypopygium of male small, almost bare, obliquely ascending, destitute of elongate processes, central filament robust, rapidly tapering to the apex, arcuate, free, except its apex; hind margin of fifth abdominal segment ventrally fringed with spinous bristles, many of which are as long as this segment; legs in both sexes simple, first joint of hind tarsi slightly thicker than that of the front ones, hind femora spinose on the under side; wings hyaline, veins dark brown, normal, stigma brown. 6 mm.

Alaska.

Closely related to *virgata* Coquillett, but in that species the spinous bristles on the ventral portion of the fifth abdominal segment in the male are arranged in a round cluster, and none of them exceed one fourth the length of this segment; both sexes have the mesonotum dark gray pruinose and marked with three distinct, polished black vittæ.

Empis fumida Coquillett.

Proc. Wash. Acad. Sci., 1900, p. 409.

Differs from the above description of *pellucida* only as follows: Palpi and proboscis black, legs always wholly black, eyes of male less widely separated than width of lowest ocellus, mesonotum highly polished, not distinctly vittate, scutellum bearing six or more bristles, hypopygium quite thickly covered with hairs, the central filament hidden, except, sometimes, its apical portion, wings pale brown, more yellowish at base and in costal cell. 7 mm.

Alaska.

It is with hesitation that I have included this, the following, and even the preceding species in the same group with *virgata*. In more than one case has Mr. Coquillett arranged a series of species the description of one of which depends upon the foregoing, until at last a form is reached in no wise related to the first species, but which depends on the first description for its recognition. In the present instance *pellucida* depends on *virgata*, *fumida* on *pellucida*, and *infumata* on *fumida*, but in no case but the first is mention made of the peculiar and very conspicuous ventral process of the males.

Empis infumata Coquillett.

Proc. Wash. Acad. Sci., 1900, p. 409.

Same as *fumida*, except that the palpi and horny parts of the proboscis are yellow, central filament of hypopygium of male free, except at the apex, no fringe nor cluster of spinous bristles on ventral portion of the fifth or other abdominal segments, hind femora destitute of spinous bristles on the under side, at most with a few weak bristles on the apical fourth. 5 mm.

Alaska.

Empis cæligena sp. nov. (Fig. 107).

Male.—Ground color black, silvery gray pollinose. Eyes wine color, contiguous for about one-third of the distance between the antennæ and the ocelli, facets uniformly small; palpi pale fuscous, short, extending straight forward, with numerous long black hairs below, proboscis not twice the head-height in length, slender, reddish at the base, black apically; antennæ a little longer than the head-height, black, first and second joints short, provided with black hairs, second joint one-half the length of the first, third joint slender, beyond the basal fourth of almost equal thickness, blunt at the tip, the arista small, one-eighth as long as the third joint; occiput cinereous, with numerous black hairs indistinctly, irregularly arranged in three transverse rows, the lower occiput bare in the middle. Thorax gray dusted, not at all tinged with brown, the usual four vittæ of the dorsum black, not brown, broadly bordering the two outer vittæ are rather long hairs, the marginal bristles of the dorsum not markedly thicker than the other hairs, humeri with rather long hairs, pronotal collar consisting of short hairs, above the base of each coxa is a small bunch of hairs, the prehalteral row consisting of twelve hairs, scutellum with about twelve marginal bristles. Abdomen short, robust, deflected at the tip, with silvery-gray pollen, not silky in lustre, with long fine hairs, especially noticeable on the sides of the basal segments; antepenultimate ventral segment with a short, broad, median bifurcate process, lateral to which the posterior margin of the segment is emarginate, sixth ventral segment small, hidden by the fifth and the last; hypopygium small, but robust, closed, middle lamellæ large, almost cordiform with the emargination above, enveloping nearly the whole of the hypopygium, upper lamellæ small, central filament completely hidden. Coxæ black, cinereous, paler apically, front and middle ones with numerous fine black hairs on the forward side, hind ones with a few long hairs on the inner and outer sides; legs simple, fuscous, extreme tip of the femora and the tarsi darker, tarsi almost black; legs wholly covered with long and rather dense black hairs, short, dense and almost bristle-like on the plantar surface of the tarsi, femora stout, but not thickened, hind ones reaching beyond the end of the abdomen, hind tibiæ slightly thicker than their femora, the other tibiæ more slender; metatarsi not thickened, front ones as long as the two following joints, middle ones equal to the next, hind ones somewhat shorter, than the next two joints; pulvilli grayish, not enlarged. Halteres pale yellow. Wings hyaline, with a faint brownish tinge, stigma nearly obsolete, veins strong, fuscous; discal cell short, broad, the first section of the fourth vein bounding it anteriorly, but slightly less than two-thirds the length of the second section; furation of the third vein takes place beyond the end of the marginal cell, the posterior branch ending just in advance of the extreme wing-tip; twice the length of the anterior branch; two rather long bristles present near the base of the costa.

Female.—The female differs from the male in the following characters: eyes separated nearly twice as widely as the posterior ocelli; scutellum generally with eight bristles; abdomen more flattened, tip not deflected, color of the abdomen more yellowish gray; the hairs of the legs much reduced, those of the underside of the femora more evidently bristle-like; tibiæ not as thick as the femora; only one long costal bristle near the base of the wing. 5.5 mm.

Alabama (C. F. Baker).

***Empis teres* sp. nov. (Figs. 133-142).**

Male and Female. Length 4-5 mm.—Black, silvery gray pollinose (female less silvery). Occiput, front and face gray pollinose; eyes maroon color, facets uniformly small, eyes of the male separated the width of the front ocellus, the front of the female broader; palpi short, slender, not exceeding the mouth-opening, pale yellow; proboscis once and one-half the eye-height, slender yellowish; antennæ slender, as long as the eye-height, first joint moderately long, first and second fuscous, third joint black, as long as the first two together, arista one-third the length of the third joint; bristles of the occiput arranged in two definite rows. Thorax dusted with silvery gray in the male, female with a slightly brownish tinge to the notum, dorsum with indications of four darker vittæ, the outer two abbreviated in front, and very faint, the intervittal spaces with sparse short black bristles, but few humeral and marginal bristles, the series in front of the halteres indefinitely consisting of about five bristles, of which only two are long; scutellum with from four to six marginal bristles, generally with two well-separated median and two short outer bristles; pectus devoid of bristles. Abdomen sparsely hairy, dull grayish in the female, silky white pollinose in the male, ground color of the narrow posterior margins of the individual segments whitish; hypopygium compressed, narrow, gaping, the central filament slender, strongly bowed, hidden at the very tip, the lamellæ extending obliquely upward, lightly dusted, middle lamellæ emarginate above, the upper lamellæ not deeply but broadly excised above. Coxæ and legs yellowish, the tips of the trochanters and of the femora narrowly black, the black hairs of the legs not dense, in the male the hairs are long, especially on the outer portions, tarsi and more or less of the tip of the tibiæ darkened; legs of the female simple and slender, of the male slender, but the tip of the hind femora beneath with three subterminal small tubercles in longitudinal series, the proximal globose, the middle one a little toward the inner side, truncate and bounded outwardly by a distinct black spine, the third medially placed and bounded both inwardly and outwardly by a row of black bristles, the outside row being of greater extent; corresponding with the femoral tubercles the base of the tibia is peculiarly dentate, the three basal teeth evident and each tipped with a black spine, beyond the teeth the under edge of the tibia is serrulate and ciliate with short black hairs; the hairs of the outer edge of the tibiæ and tarsi long, tarsi of both male and female beneath with short thick black bristles, metatarsi about equal to the next three tarsal joints, the front metatarsi of the female and the middle metatarsi of the male are, however, shorter, the hind metatarsi of the female and the fore and hind ones of the male are as thick as the tips of the tibiæ. Halteres pale yellow. Wings clear hyaline, veins narrow fuscous, stigma obsolete, the third vein stronger than the others, furcate before the tip of the marginal cell, the furcation

acute, the anterior branch straight, the posterior branch terminating in the wing-margin slightly beyond the tip; first submarginal cell broader than the marginal, about as broad as the first posterior cell; sixth vein evanescent toward its apex; no strong costal bristles present.

Nineteen specimens; Idaho (J. M. Aldrich).

Empis loripedis Coquillett (Fig. 131).

Proc. Nat. Mus., 1895, p. 400.

Male.—Head black, gray pollinose; eyes separated as widely as the posterior ocelli, facets of a uniform size; antennæ black, third joint somewhat over twice as long as the first, slender, tapering gradually to the middle, thence of an equal breadth; style nearly one-third as long as the third joint; proboscis one and one-half times as long as the height of the head, palpi yellow. Thorax black, opaque gray pollinose, marked with four dark brownish vittæ, almost destitute of pile, the bristles black; pleura black, sometimes partly yellowish, bluish gray pollinose, pile in front of halteres black; scutellum black, gray pollinose, bearing two bristles. Abdomen compressed, shining, black; the broad hind margin of each segment laterally yellow, sometimes extending to the anterior edges of the segment, dividing the black color into three vittæ, medio-dorsal and lateral; pile of abdomen sparse, black; venter yellow; hypopygium rather large, ascending, abundantly black-pilose, middle lamellæ yellow, broadening to the tip; filament very thick at base, then suddenly attenuated and bristle-like, arcuate. Legs, including the coxæ, light yellow; apical half of front tibiæ and extreme apex of the others, front tarsi wholly, apex of the first two joints and the whole of the remaining joints on the middle and hind tarsi, usually but not always a dark brown; all the tibiæ and tarsi furnished with numerous long black pile; on the under side of each hind femur before its apex is an irregular, three-pronged process, and on the inner side of each hind tibia near its base are two processes, one behind the other; just before the basal process the tibia is hollowed out; front metatarsi nearly twice as long and three times as thick as the middle ones, hind metatarsi one-half thicker and one-third longer than the middle ones. Knob of halteres light yellow. Wings dark gray, stigma slightly darker, vein dark brown. 6-7 mm.

Female.—Like the male, except that the hind femora and tibiæ are destitute of processes, the front metatarsi are not thicker than the middle ones, while the hind metatarsi are much thicker than and fully as long as the front ones; abdomen tapering to the apex.

Illinois and Ohio.

Empis gladiator sp. nov. (Fig. 134).

Male and Female.—Length 6-7 mm.—Rather slender, more or less yellow species. Head black, cinereous, occiput somewhat conically formed; eyes wine-red, separated a little more widely than the posterior ocelli, which are, however, rather close together, facets small, uniform; palpi slender, yellow, with very few short hairs; proboscis one and one-half times the head-height, yellowish, the extreme tip darkened, the labella fleshy, fulvous, reaching down one-half the length of the proboscis in the male and to the tip in the female; antennæ slender, as long as the head-height, the first two joints dark fuscous, provided with a

few short hairs, the first joint over twice as long as the second, the third joint twice as long as the first, glabrous, lanceolate, somewhat blunt in the female, black, the arista two-thirds the length of the third joint; bristles of the occiput in two rows. Mesonotum normally with brownish gray dust over a black ground, sometimes the covering effaced, when the thoracic disc is highly polished, marked with four brown, conspicuous, rather broad vittæ, the outer two abbreviated in front; the intervittal spaces with a few minute bristles, margin of the notum with four macrochètæ, one on the humerus, one supra-alar, one on the post-alar ridge and one in front of this; scutellum with two marginal macrochètæ; the humeri, pectus, post-alar ridge, margin of the scutellum, sides of the metanotum and the pleuræ largely yellowish, dusted with cinereous; the ground color of the pleuræ darkened above the base of the four posterior coxæ and in front of the root of the wings; bristles of the pronotal collar slender, sparse, of the metapleural row about three in number. Abdomen shining, yellowish, with an indistinctly limited median blackish stripe; the segments with a subapical series of long slender black bristles, the hairs of the abdomen sparse and minute; hypopygium comparatively long, vertical, yellowish, not densely provided with hair, nearly closed, but its parts visible, central filament slender, curved, exposed, except near the tip, the middle lamellæ erect, their posterior margin inflected, the apical corner with a deep emargination; the upper lamellæ relatively small, with dense, fine hairs; styles of the female reddish. Coxæ yellow, all provided with few black hairs on the front surface near the tip; trochanters and tip of femora with the usual small black spots; legs yellow, except the more or less brownish tarsi, rather slender, the hind femora not surpassing the abdomen and not longer than the tibiæ; none of the metatarsi thickened, the front ones as long as the next three joints, the hind ones somewhat shorter, the middle metatarsi as long as the two succeeding joints; the last four tarsal joints with a double series of spinose hairs; legs clothed with short black hairs, longest distally and conspicuous on the hind legs of the male; trochanters simple; the hind femora of the male swollen on the outer third, provided with a subapical median tubercle on the under side, which is tipped with a slender black spine curved towards the end of the femur, on a line with this, but on the infero-exterior edge, is a short fringe of black bristles, on the outer under edge, opposite the fringe, is a scoop-shaped triangular dilatation of the femur, with a subapical emargination on the hind edge; these processes articulate with structures near the base of the tibia, the median spine of the femur corresponding with an elongate blunt tubercle, into the emargination of the femoral scoop fits a small tooth which is provided on the outer side with a small fringe of black bristles; the apex of the hind femora provided with a series of bristles above, and narrowed as in the angulate basal part of the tibia; legs of the female simple, not thickened. Halteres pale yellow. Wings slender, long, hyaline, with a faint brownish tinge, no stigmal spot present; the furcation of the third vein, which takes place opposite the end of the marginal cell, the posterior branch ending beyond the wing-tip; discal cell rather small, the proximal section of the vein bounding it anteriorly one-fourth the length of the second section, no long costal bristles present.

Numerous specimens of both sexes. Lawrence, Kansas (Dr. S. W. Williston).

***Empis arthritica* sp. nov.** (Figs. 135, 144).

Male and Female. Length 5 mm.—Slender, pale gray pollinose. Eyes of the male separated as widely as the length of the second antennal joint, in the female somewhat more, facets uniformly small; palpi small, pale yellow, with but one minute subapical black hair; proboscis about twice the height of the head, reddish, labella as long as the proboscis, pale yellow; antennæ slender, black, about as long as the head-height, the first joint two times as long as the second, the third joint nearly three times the length of the first, slender, lanceolate, not sharp at the tip, arista scarcely longer than the second antennal joint; occiput black, cinereous-pollinose, its bristles small, in two transverse rows. Thorax light gray pollinose, the dorsum quadrivittate with brownish, the intervittal bristles very sparse and minute; one large humeral bristle present, the marginal macrochætæ three in number; in front of the halteres two small and one minute bristles, the scutellum with two central small and two outer minute bristles; no pectal bristles, pronotal series minute; the ground color of the pectus, the humeral callosities, edge of the scutellum, and two pleural spots above the middle and hind coxæ more or less yellowish. Abdomen shining, glabrous, except for a few short submarginal bristles, yellowish; hypopygium yellow, moderately small, compressed, nearly vertical, nearly closed, central filament thickened at the base, curved, exposed, except the tip, middle lamellæ comparatively small, convex, excised at the tip, the upper lamellæ small, exposed. Legs including the coxæ yellow, trochanters and femora tipped with a small black spot, the tarsi brownish apically; legs slender, the hind femora reaching or surpassing the end of the abdomen; all the metatarsi about as long as the two following joints, the front ones of the male a little longer, nearly as thick as the tibiæ but not appearing swollen, the tarsi spinose beneath, pulvilli minute, yellowish; trochanters simple; hind knees of the male armed, the femora gradually but slightly thickened distally, at the distal fourth on the outer inferior edge with a small tubercle capped by a pencil of black bristles, beyond which is a series of five scattered bristles, the inner inferior corner is explanate into a concave plate which is excised proximally to a spur and carina, the tibia exceedingly thin at its angular base, then suddenly swollen inwardly and produced as a strong bristly process which articulates into the concavity of the femoral plate, the outer edge of the abrupt tibial swelling deeply excised to receive the incurved femoral spur. Halteres pale yellow. Wings narrow, nearly hyaline, no stigmal darkening, veins fine, dark fuscous, the third vein furcate slightly in advance of the end of the marginal cell, its posterior branch terminating slightly beyond the wing-tip; the first section of the anterior border of the discal cell one-fourth the length of the second section, the discal cell narrow; first and second posterior cells of equal width at the base; costa destitute of long bristles.

Montgomery Co., Pennsylvania (C. W. Johnson).

***Empis podagra* sp. nov.**

Male and Female. Length 6 mm.—Black, more or less coated with cinereous pollen. Eyes separated as widely as the distant posterior ocelli, facets uniform, small. Palpi black, sparsely bristly toward the tip; proboscis wholly black, about one and one-half times the head-height. Occipital bristles dense, in two rows. Thorax wholly cinereous, marked with four brown mesonotal vittæ

which are as wide as the intervittæ; intervittal bristles minute, sparse; scutellum with four bristles, the central pair widely separated; six fine hairs in the meta-pleural row. Abdomen slender, black, the male abdomen is shining above, excepting the first and half of the second segments, abdomen of the female sparsely dusted; hypopygium shining, black, terminal, not large, upper lamellæ visible one-third as large as the oblong middle lamellæ, both densely hairy, central filament moderately slender, strongly arcuate, basal part exposed. Coxæ cinereous, trochanters black; legs short, femora brown, piceous apically, hind ones reaching the fifth abdominal segment, tibiæ piceous, black apically, tarsi black; of the male the hind femora are provided with a long sharp bristly projection just beyond the middle of the outer under side, between this and the tip of the femur with a small median mammiform tubercle, the apical fourth of the outer under edge is fringed with sparse bristles commencing in a dense pencil, the apical eighth of the inner under edge is provided with a dense fringe; the hind tibiæ of the male suddenly swollen near the knee to a flat prominence tipped with a long black pencil, diagonally across from this is a swollen tubercle provided with a black brush on its flattened top, the hind tibiæ densely bristly; hind metatarsi thickened, and of the male the front ones likewise, the hind ones of less diameter than their tibiæ, the front ones of greater diameter, tarsi densely spinose below. Halteres yellow. Wings hyaline, with a faint cinereous tinge, stigmal spot elongate, the furcation of the third vein slightly before the tip of the marginal cell, the vein between the first basal and the discal cells shorter than that between the second basal and the discal cells, and one-fourth the length of the second section of the anterior border of the discal cell; anal vein thin.

Three males and two females; Juliaetta and Peck, Idaho. From Prof. J. M. Aldrich.

Empis mira Bigot.

Enoplempis mira Bigot, Bull. Soc. ent. France, 1880, p. 47.

Enoplempis Bigot.—Hind femora robust; below, at the tip, strongly armed and unidentate, the tibiæ below at the base similarly mucronate and unidentate, the teeth with small hairs, thick.

E. mira. Male.—Fulvo-testaceous; the apex of the antennæ, the proboscis above, five vittæ of the thorax, the lateral ones interrupted, fusco-canous; wings yellowish. 6 mm.

California.

Empis Bigoti nom. nov.

Enoplempis cinerea Bigot, Bull. Soc. Ent. Fr., 1882, p. 91.

Cinereous, antennæ fuscous; front cinereous; thorax with four castaneous vittæ; incisures of the abdomen fuscous; halteres testaceous; trochanters infuscated; legs fulvous; femora, the apex of the tibiæ and the tarsi fuscous, posterior tibiæ infuscated over all; wings subhyaline, with a scarcely perceptible, elongate, very slender fuscous stigma. 6 mm.

California.

In addition to this the generic characters may be added, as given under *E. mira* Bigot.

In as much as Mr. Coquillett has recognized "what is evidently this species" it seems unjust to Mr. Bigot that "as the name *Empis cinerea* is preoccupied for a European species, Bigot's description of *Enoplempis cinerea* should be cancelled." It is better to adopt a more general precedent, so hereafter the species may be known as *E. Bigoti*.

***Empis manca* Coquillett.**

Proc. Nat. Mus., 1895, p. 406.

Male.—Head black, gray pollinose, eyes separated the width of the lowest ocellus, facets of a uniform size; antennæ black, third joint narrow, elongate, style one-third as long as the third joint; proboscis one and one-half times as long as height of head, palpi yellow. Thorax black, opaque, gray pollinose, marked with four black pollinose vittæ, its sparse pile and bristles black; pleura black, light gray pollinose, its pile black; scutellum black, gray pollinose, bearing four black bristles. Abdomen dark brown, hind margin of each segment whitish, opaque whitish pollinose, its pile or bristles along the hind margins of the segments long, black; hypopygium yellowish brown, very large, erect, its pile black; central filament very robust, arcuate, free except towards the apex, its extreme tip dilated. Legs slender, yellow, including the coxæ; on the under side of the hind femora, before the apex, is a low swelling, in front of which is a robust, backwardly directed hook, while between the apex of the femur and the swelling on the inner side is a black, conical projection fringed near the base behind, with one large and two small tooth-like projections; on the front and also on the hind side of the hind tibiæ near the base is a fringe of short black bristles, below which, on the inner side of the tibia, is a conical projection, at which point the tibia is rather suddenly bent outward; hind metatarsi slightly thicker, but shorter, than the front ones. Halteres yellow. Wings grayish hyaline, stigma and veins brown, a long bristle on the costa near its base.

Female.—Same as the male, except that the front is slightly broader, the abdomen blackish, light gray pollinose, and the hind legs simple, but much thicker than the others. 4-5 mm.

Southern California (Coquillett).

***Empis valentis* Coquillett (Fig. 138).**

Proc. Nat. Mus., 1895, p. 402.

Female.—Differs from *Empis comantis* as follows: femora entirely yellowish, apices of tibiæ and whole of tarsi black, third antennal joint twice as long as the first, style less than one-half as long as the third joint. Pile of thorax sparse, black; on each end of the pleura, coxæ, abdomen and venter, wholly black; on venter and on sides of abdomen very short and sparse. Scutellum destitute of white pile, naked, except for the ten marginal bristles. Abdomen opaque, light gray pollinose, hind margins of the fifth and sixth, and the following segments wholly, shining. Femora not thickened, the hind ones scarcely thicker than their tibiæ; pile and bristles of femora minute. Wings hyaline, anterior branch of the third vein straight and nearly perpendicular. 9 mm.

Northern California.

This species, which is associated with *E. comantis* only in locality, must be further characterized thus:

Male and Female.—Eyes of the male widely separated. The usual apical femoral black spot is broadened in the male; the hind femora of the male are curved and are provided with a large bifid tubercle on the under side at the outer fourth, the inner spur of which is short, the outer provided with a bunch of short black hairs, beyond this on the inner under edge of the femur is a small mammiform process, beyond which is a fringe consisting of four small black spine-like hairs; the hind tibiae are nearly straight, near the base on the inner under side with a large tubercle, apically provided with a bunch of short black hairs forming a spur-like pencil, distal to this on the outer under edge of the tibia is a still larger tubercle, which is fringed outwardly by a series of long black hairs. Metatarsi not enlarged, tarsi strongly spinose beneath. Hypopygium terminal, small, closed, central filament swollen at the exposed base, upper lamellæ projecting beyond the middle ones. Halteres black. The scutellar bristles vary in number from six to twelve. The bristles in front of the halteres are dense, about twenty in number.

Numerous specimens from various parts of California.

***Empis clauda* Coquillett.**

Proc. Wash. Acad., 1900, p. 407.

Black, the palpi, proboscis, humeri, lateral margins of metanotum, scutellum, a large spot below insertion of each wing, the halteres, coxæ and remainder of legs, also base of venter, yellow, apices of tarsi brown; eyes of male separated less than width of lowest ocellus, third joint of antennæ broad at base, tapering rapidly to the apex, about twice as long as the style, proboscis slightly over twice as long as height of head; hairs and bristles of body and legs black; mesonotum opaque, gray pruinose, marked with four indistinct, brownish vittæ; scutellum bearing four bristles; abdomen slightly polished, hypopygium small, ascending obliquely, the dorsal piece prolonged at each posterior corner in the form of a flattened, almost linear process, central filament unusually robust, arcuate, free, except toward its apex; no ventral process in front of the hypopygium; hind femora of male each bearing a hook-like process on the under side a short distance before the apex, curved backward and covered with short hairs, while beyond it are two bare, pimple-like swellings; on the inner side of the femora, nearer the apex, is a fringe of about five rather short spinous bristles; hind tibiae of male each bearing a bare, slightly arcuate process on the outer side near the base, while opposite it, on the inner side, is a low prominence beset with short bristly hairs; legs of female simple, not fringed with scales; wings grayish hyaline, stigma brown, veins brown, normal. 5-7 mm.

Alaska.

***Empis poplitea* Loew.**

Cent. iii, 29.

Male and Female.—Cinereous, opaque, all the hairs and bristles short, black. Head concolorous, black-pilose, eyes of the male separated. Antennæ black, third joint elongated and strongly attenuated towards the apex. Palpi very small, testaceous. Proboscis strong, black, badius above, nearly equalling twice the length

of the head. Thorax with four fuscous vittæ. Hypopygium of the male small, rather sunked and closed, the upper lamellæ small, grayish black, the lower small, testaceous, the central filament hidden. Coxæ blackish, cinereous. Legs red, with sparse black pile, the hairs of the tibiæ and of the tarsi longer and a little more dense; the extreme tip of the femora spotted with a black dot; apex of the tibiæ blackish; tarsi black, the base of the first joint often dark red; posterior knees of the male drawn out into three strong apophyses, one at the tip of the femora and two at the base of the tibiæ. Halteres dusky yellow. Wings rather long, the veins strong, fuscous, stigma pale yellowish, rather faint. 5 mm.

Sitka, Alaska (Sahlberg).

Unfortunately the few minor characters omitted in this description make it impossible to include this species in our table.

Mr. Coquillett determines specimens received from Prof. Cockerell, from the Hudsonian Zone of New Mexico as Loew's species.

The following characters are common to the remaining species, which, with the five preceding, constitute a very natural group.

Body black, closely pollinose, occiput biserially black bristly, densely above and beneath. Eyes dark red, separated as widely as the posterior ocelli at the narrowest part of the front in the male, and slightly more in the female. Palpi small, slender, curved, yellowish, more or less fuscous at the base, with one preapical minute black bristle, or none. Proboscis one and one-half to two times the head-height, dark red, not thick but strong, the labella slender, black. Antennæ black, equalling the eye-height, the first two joints cylindrical, with a few short black hairs, and more or less pruinose, together shorter than the third joint; third joint lanceolate, opaque jet black, the style one-third the length of the third joint, of smaller diameter than the tip of the joint. Thorax quadrivittate, generally with broad brown vittæ, the middle ones abbreviated posteriorly and the lateral ones anteriorly; the intervittal bristles minute, a small median row present; a bunch of bristles under the halteres, dorsum margined by three or four short macrochætæ. Abdomen straight, opaque pollinose, longer than the head and thorax together, with very few bristles and no pubescence; hypopygium small, closed, densely pubescent, the central filament swollen at the base, of the shape of a scorpion-sting, reddish. Coxæ dusted, provided with black bristles on the forward side, the hind ones always with a bunch near the tip below, trochanters tipped with black or wholly black, femora with a narrow terminal black ring if light colored;

legs more or less shining; tarsi always short spinose beneath; the hind knees of the male with peculiar sexual armament, legs of female simple, not fringed with scales; pulvilli and claws small, the pulvilli dirty white, the claws reddish at the base, black apically. Halteres pale yellow. Wings nearly pure hyaline, the veins strong, dark fuscous, no stigmal spot or with a very faint indication of one, no strong costal bristles.

Western species.

***Empis aerobatica* sp. nov.**

Male and Female. Length 5 mm.—Gray-dusted species. Eyes of the male separated twice as widely as the posterior ocelli, of the female scarcely more. Palpi yellow, with one minute hair beneath. First antennal joint scarcely one and one-half times the length of the second joint. Thoracic vittæ narrow, as broad as the intervittæ, generally well defined, the intervittæ gray, with a slight bluish tinge when viewed in a strong light; but one marginal bristle above the base of the wings. Bristles of the occiput, pronotum, humeri, scutellum, abdomen and legs minute; scutellum with four bristles; about five minute bristles in front of the halteres, pectus with about three minute bristles on each side. Hypopygium in part gray-dusted; central filament gradually narrowed, brown; upper lamellæ triangular, about two-thirds as large as the middle ones, wholly visible. Coxæ more or less darkened at the base, legs fuscous, darker on the femora above and the tibiæ apically; tarsi short spinose, front and middle ones not enlarged, hind ones moderately thickened; hind femora not thicker than the tibiæ, not reaching the hypopygium, in the male provided with a short diagonally transverse process, the inner apical angle of which bears a pencil of black hairs, beyond which the inner inferior edge of the femur is ciliate with about four bristles and a few hairs; the base of the tibia bears on the under side two prominent tubercles, the first with a scattered pencil of black bristles, the second with a brush of short hairs on its obliquely truncate apical edge. Wings narrow, clear hyaline, those of the male with a very long base; furcation of the third vein variable, before the end of the marginal cell, or opposite the end, the posterior branch terminating near the extreme wing-tip; discal and posterior cells rather elongate, the hind margin of the discal cell about three-fourths the length of the outward continuation of that vein; anal vein much reduced, sharply vanishing.

Seven males and four females; California and Idaho.

This is the balloon-making fly about which Messrs. Aldrich and Turley have written a most entertaining account in the *American Naturalist*, 1899. The male forms a large hollow frothy bag, in the front end of which is imprisoned a small fly. Flying with this structure between its hind legs it courts the female who alights on the back of her selected mate. The pair then settle slowly to the ground, and after copulation the male discards the balloon which then has served its purpose of attracting the female during courtship.

Empis nodipes sp. nov. (Fig. 143).

Male. Length 6.5 mm.—A slender species. Cinereous, plumbeous. Eyes maroon-colored, separated as narrowly as the posterior ocelli, facets moderately small; palpi small, fuscous, with one short subapical black hair; proboscis scarcely one and one-half times the head-height, reddish, the black labella not reaching to the tip; antennæ slender, shorter than the head-height, black, piceous at the base, first joint over two times the length of the second, third joint three times the length of the first, lanceolate, the arista as long as the first joint; bristles of the occiput sparse, minute, in two transverse series. Thorax plumbeous gray, the dorsum with four narrow brown vittæ, the outer much abbreviated anteriorly; the intervittal bristles minute, the marginal macrochètæ short, few in number; four short bristles in the row in front of the halteres, pronotal bristles wanting (broken?); but two small scutellar bristles. Abdomen slender, cinereous, opaque, without macrochètæ; hypopygium small, closed, central filament much swollen at base, the basal part exposed, remainder hidden, middle lamellæ convex, shining, truncated above, hiding the small upper lamellæ. Legs including the coxæ yellow, slender, tips of trochanters and of femora minutely black, tarsi brownish toward tip, tarsi slender, long, spinose beneath, metatarsi not thickened, macrochètæ of legs moderate; trochanters unarmed; hind femora swollen near the tip, the outer inferior angle of the swelling with a fringe of black bristle-like hairs; hind tibiæ with a similar swelling near its base, but ciliate on both sides with black hairs, hind tibiæ on inner side at the tip fimbriate with short yellow scales; hind femora not reaching the hypopygium, scarcely as thick on basal portion as the apical part of the tibiæ. Halteres pale yellow. Wings subhyaline, veins thin, dark fuscous, stigma obsolete; third vein furcate before the tip of the marginal cell, the posterior branch ending beyond the tip of the wing; the first section of the front border of the discal cell one-fourth the length of the second; second posterior cell very narrow at its base; no long costal bristles.

A single male; Magdalena, New Mexico.

Empis serperastrorum sp. nov. (Figs. 136, 145).

Length 6-7 mm.—Olivaceous gray species of exceedingly great variability in the color of the appendages. Palpi reddish to black, with a few hairs; proboscis wholly black, sometimes reddish on basal part, labella never exceeding the proboscis in length. First antennal joint two times the length of the second. Occipital bristles sparse, or dense; thoracic bristles sparse; scutellum with two small widely separated bristles, females often with four; the row in front of the halteres consisting of from three to five small bristles. Hypopygium small, terminal, not higher than the abdomen, or sometimes slightly larger, upper lamellæ concealed, central filament flat exteriorly, completely hidden, the tip not explantate. Legs including the coxæ wholly black, or wholly yellow, except the darkened tarsi, rather stoutish; the hind femora reaching the tip of the abdomen in the female, but comparatively shorter in the male; the hair-like bristles rather dense on the front metatarsi and on the outer portion of the hind tibiæ of the male; all the parts of the female leg slender; of the male the front metatarsi are swollen slightly beyond the thickness of their tibiæ, the remainder of the legs, except the hind knees, simple; hind femora widened laterally on the

outer third before the tip, on the underside with a short, thick, transverse bifurcate process, the outer projection of which is closely fimbriate within with black scale-like hairs, while the inner is sharply angulate and terminates in a distal direction as a short spur, midway between the outer projection and the tip of the femur are three closely placed bristles; articulating into the distal end of the femur is a large bristling projection on the tibia, distal to which and articulating with the fimbriate edge of the outer bifurcation of the femoral process is a small median tubercle, across from this on the inner (posterior) side of the tibia is a prominent bifurcate bristly process directed distally and medially, beyond which is another median tubercle, but larger and more pointed than the first, or sometimes reduced to a mere swelling; the tips of the two bifurcate processes are always black, the bases are always concolorous with the rest of the legs; middle tibiæ of both sexes tipped with a series of from five to eight stiff black bristles on the inner side. Wings sometimes faintly smoky, veins narrow to strong; stigmal spot very faint; furcation of the third vein opposite or in advance of the tip of the marginal cell, its posterior branch ending beyond the wing-tip; the first section of the anterior boundary of the discal cell about one-fourth the length of the second section; hind margin of the discal cell shorter than the outward continuation of that vein.

Colorado and Idaho (J. M. Aldrich). Ninety specimens of both sexes.

***Empis dolabraria* sp. nov.**

Male and Female. Length 6 mm.—A brownish species. First antennal joint one and one-half times the second; palpi yellow; occipital bristles numerous, confused, long below. Scutellum with six marginal bristles, the cluster in front of the halteres consisting of six to eight, a small bunch of hairs present above the base of the front coxæ; mesonotal vittæ broad, brownish, abdomen of the male brownish gray, concolorous with the scutellum, intervittal spaces and the pleuræ; abdomen of the female gray. Abdomen short; hypopygium small, outer portion of the base of the central filament visible, the middle lamellæ small, the upper lamellæ porrect, extending upwards. Coxæ blackish, the very tips paler, trochanters black; legs short, reddish, the tarsi black, hind femora and tibiæ somewhat bent, rather stout, the hind femora not reaching the end of the abdomen, tarsi long spinose beneath, hairs of the tibiæ strong, bristles short; male hind femora slightly swollen on the posterior side before the tip, beneath with a subapical transverse bifurcate process, the outer projection of which is long and tipped with a minute pencil, male hind tibiæ suddenly enlarged beyond the knee and there sparsely ciliate on both sides with black bristles, beyond the swelling there is a prominent process on the outer inferior edge fringed on the proximal side with short scale-like bristles. This articulates with the larger projection of the femoral process. Wings rather broad in the male, slender in the female, clear hyaline, the third vein furcate beyond the tip of the marginal cell, the posterior branch ending at the wing-tip, the proximal section of the anterior boundary of the discal cell more than one-fourth as long as the distal section, the hind boundary three-fifths as long as the continuation of that vein.

A male and a female; California (Baron).

***Empis dolabraria* subsp. nov. *disconvenita*.**

An incipient species which will have to be connected with the foregoing for the present.

The differences lie in the wing-neuration; the furcation of the third vein takes place opposite the end of the marginal cell, the posterior branch of the fork terminates beyond the extreme wing-tip; the discal cell is larger, the first section of its front border is less than one-fifth the length of the second section, while the hind border is as long as the continuation of that vein. The occipital bristles are much stouter in this form.

One male and one female; California.

***Empis falcata* sp. nov. (Fig. 137).**

Male and Female. Length 7.5 mm. or less.—A very slender species, with sparse bristles. Face and front narrow; palpi pale, with two minute preapical hairs: labella less than two-thirds as long as the proboscis; antennæ slender, comparatively long, the first joint fully two times as long as the second, the third joint narrow at the base and gradually attenuated, rather blunt at the tip, the style less than one-fourth the length of the third joint. Scutellum with two small widely separated marginal bristles, and a minute outer pair on each side of these; no pectal bristles; pronotal collar minute but distinct; in front of the halteres are three small bristles. Hypopygium projecting above the abdomen, comparatively large, the central filament not suddenly enlarged, plainly visible at the base, the middle lamellæ large. Legs slender, wholly yellowish, except the usual spots on the trochanters and the knees, their bristles strong, especially on the hind tibiæ and the tarsi, but nowhere lengthened; tarsi long and slender, especially the front and middle pairs; hind femora not reaching the hypopygium, with a subapical lateral tubercle on the posterior side, in front of which on the under side is a transverse bifurcate process, the inner (posterior) portion of which is slender, strongly curved and pointed, the outer is short and stout and tipped with a pencil of black scale-like bristles; hind tibiæ somewhat curved, slender at the knee, articulating with the lateral femoral process is an emarginate, almost medially placed process, the posterior portion of which is tipped with a small curved brush of black hairs, diagonally in front of this, but still on the lower side of the tibiæ, is a broad, flat protuberance, black apically and fringed on the outer edge with long stout black bristles. The third longitudinal vein furcate at the tip of the marginal cell, the posterior branch ending beyond the extreme wing tip, the first section of the anterior border of the discal cell less than one-third the length of the second section, the hind border shorter than the continuation of that vein.

One male from Berkely, California, March 26, 1897; collected by Dr. Wm. M. Wheeler. A male and a female, Juliaetta, Idaho; collected by Prof. J. M. Aldrich.

***Empis canaster* sp. nov. (Figs. 139, 140).**

Male and Female. Length 7 mm.—A slender gray species. Palpi infuscated at

the base, provided with one long and several short preapical fine black hairs; labella more deeply bifid than usual in this group; first antennal joint two times the second; the third joint rather slender; postocular bristles short. Prothoracic collar even; humeral bristles small; no pectoral bristles; scutellar bristles inconstant, generally two small and two minute bristles; the row in front of the halteres with three to five small bristles. Abdomen slender, long; the middle lamellæ of the hypopygium erect, strongly shining, covering the upper lamellæ, the swollen basal part of the central filament visible. Coxæ reddish apically, or wholly yellow, their bristles reduced; legs slender, hind femora shorter than the abdomen; legs reddish, except the front tarsi and more or less of the remaining tarsi, which vary from brown to black; front metatarsi of the male three-fourths as long as their tibiæ and of slightly greater diameter; bristles of the legs becoming fine and long apically, especially on the outer side of the male hind tibiæ; the spine-like bristles of the plantar surface of the tarsi rather long; armament of the hind knees of the male close to the femero-tibial joint; hind femora slender, but little thickened at the armament, hind femora and tibiæ but little bent; near the tip of the hind femur the underside is produced into a short, bipartite, transverse process, the inner projection of which is short and sharply angular, the outer flattened, situated on the median line and capped by a close fringe of short black scales; between this structure and the tip of the femur is a short sharp, backwardly directed, median tooth; hind tibiæ gradually enlarged from the knee, the slender base with a single long process on the under side, tipped with a pencil of black bristle-like hairs; these structures are not bounded by fringes of bristles. Wings long, slender, very lightly infumated; the third vein furcate before the tip of the marginal cell, the posterior branch curved backward ending beyond the tip of the wing; posterior cells long; hind margin of the discal cell nearly one-half the length of the outward continuation of the vein, the first section of the anterior border nearly one-fourth the length of the second section.

Seven males, one female; Idaho, Oregon.

***Empis mixopolia* sp. nov.**

Male and Female.—Rather stout small species of gray-brown color. Palpi infuscated more or less at the base, and with one distinct preapical bristle beneath; first antennal joint once and a half the length of the second joint, the third joint comparatively small; occipital bristles moderately long, in two well-defined rows. Thorax gray, more or less olivaceous on the dorsum and with the vittæ brown. Scutellum gray, provided with four marginal bristles; the bristles of the pronotal collar long; a small bunch of hairs present on each side of the pectus; about ten uneven bristles in front of the halteres; between the four macrochætæ above the base of the wing and the humeral macrochætæ at most but three minute bristles on the margin of the mesonotum, the humeri with few minute bristles; abdomen with small bristles towards the base; middle lamellæ of the hypopygium yellowish at the extreme tip, not entirely concealing the upper lamellæ; the whole of the thickened base of the central filament exposed; hairs of the hypopygium short. Coxæ darkened at the base, their hairs minute; legs robust, short, reddish, the tarsi and the upper side of the femora blackened; the bristles of the outer side of the tibiæ strong, uniformly widely distant (*i. e.*, six on

each side of the well-marked median glabrous streak); none of the metatarsi enlarged, the hind tarsi stoutest; hind femora distinctly bowed, hind tibiæ somewhat bent; hind femora of the male beneath with a single preapical flat tubercle which is tipped at its outer corner with a short pencil of black hairs, between this projection and the tip of the femur is a black fringe on each side beneath, the outer one containing only three minute hairs closely placed, the inner one conspicuous, consisting of four long, stout bristles, and as many hairs; the hind tibiæ of the male stout, with two prominent basal tubercles, one on each side of the median line and one in advance of the other, the more basal (on the inner side) capped by a pencil of black hairs, the other with a dense short brush. Wings clear hyaline, the third vein furcate just beyond the end of the marginal cell, its posterior branch ending at the extreme wing-tip or slightly in advance; the first section of the front border of the discal cell one-third to one-fourth the length of the outward continuation of that vein; the third vein turns slightly upward, leaving the first posterior cell distinctly wider than the first submarginal. 5 mm.

Numerous specimens from Idaho, collected by Prof. J. M. Aldrich.

***Empis æripes* sp. nov. (Fig. 141).**

Female. Length 7.5 mm.—Stout species covered with whitish gray pollen. Antennæ stout, first joint two times the second; palpi strongly infuscated, except the apex, provided with numerous minute hairs below; occipital bristles strong and dense; pronotal, pectal, humeral and coxal bristles prominent; scutellum with eight to ten bristles, four to six short and four long, alternating, the central pair long; in front of the halteres is a cluster of about nine bristles. Thoracic vittæ narrow, faint, not at all brownish, but nearly concolorous with the rest of the body. Legs stout, dark fuscous, femora above, hind tibiæ apically and tarsi blackish; hind femora and tibiæ bent, the tibial bristles stout. Wings nearly clear, the very faint stigmal spot extremely narrow, veins blackish, clear-cut, the third vein sinuous, furcate beyond the tip of the marginal cell, the posterior branch terminating before the wing-tip, the first section of the front margin of the discal cell one-fourth the length of the second section, the posterior border two-thirds the length of the vein between the third and the fourth posterior cells.

Male.—Differing from the female very markedly in the color of the pollinose coating which is not pure gray but mixed with brown. The vittæ are brown and diffuse into the intervittal spaces. The armament of the legs is very similar to that of *mizopolia*, but is carried to a greater extent; the apical fringe of the lower inner side of the hind femora contains about ten strong bristles besides the four hairs; the more distal tubercle of the tibia is longer.

This, together with the preceding species, differs from all the other species of *Empis* in the structure of the armament of the male hind knees. It is distinct, however, from *mizopolia*, being a much larger and more robust form. The black color of the whole coxa, the numerous scutellar and other bristles, the larger discal cell and diffused vittæ of the thorax, the lateral ones of which are not so much abbreviated as in *mizopolia*, and the specialized

structure of the hind legs readily separate this form from the preceding.

The collection contains numerous specimens of both sexes taken in Idaho, by Prof. J. M. Aldrich.

EMPIMORPHA Coquillett.

Same as *Empis*, except that the face is covered with long bristly hairs; antennal style apical, proboscis directed downward, longer than the height of the head; third vein forked; discal cell perfect, sending three veins to the wing margin; anal cell shorter than the second basal, the vein at its apex nearly parallel with the hind margin of the wing.

Pile in front of the halteres and on the sides of the abdomen black.....2.

Pile in front of the halteres and on the sides of the abdomen whitish.

comantis Coquillett.

2. Palpi, proboscis, legs and halteres largely reddish.....**barbata** Loew.

Palpi, proboscis, legs and halteres black.....**geneatis** sp. nov.

Empimorpha barbata Loew (Fig. 106).

Empis barbata Loew, Cent. ii, 19.

Head black, with long black pile. Eyes large, subcontiguous (male). First two joints of the black antennæ clothed with long black pile. Face bearded with black pile. Palpi large, badious, with black pile. Proboscis very long, much thickened at base. Thoracic dorsum black, opaque, black-pilose, with three cinereous vittæ, the median narrow, the outer ones broad. Pleuræ black, with cinereous-yellow pollen, bare, except for the bunch of black hairs in front of the halteres. Abdomen black, subshining, opaque, towards the sides with cinereous pollen, and provided with long black hairs. Hypopygium small, black-pilose, the lower lamellæ large, ovate, the middle filament short, awl-shaped. Legs badious, with black hair, the extreme tip of the tibiæ and the tarsi black, but the metatarsi, except the apex, and the base of the next few joints badious. Wings long, rather narrow towards the apex, fuscous, the costal cell ferruginous. 9 mm.

California.

Empimorpha geneatis sp. nov. (Fig. 105).

Male. Length 6.5 mm.—Black, occiput, pleuræ and coxæ lightly and finely gray-pollinose. Eyes contiguous above the antennæ; face, sides of occiput, cheeks, palpi and upper side of the first antennal joint bearing very many long black hairs. Antennæ one-fourth longer than the height of the head, slender, black, first joint equalling one-third the length of the antenna, second joint and style short. Dorsum of thorax black, opaque, with two faint gray vittæ; very sparingly hairy, a longer bunch of black hairs above the root of the wings; margin of scutellum with about fourteen hairs; a bunch of black hairs present between base of the wings and the halteres. Sides of first three abdominal seg-

ments with black hairs, remainder of tergum nude (the venter is eaten off by parasites); hypopygium small, not constricted at base, black, from the under side projects a small curved process, upper valves short-hairy. Legs piceous, with black hairs, especially on front side of the coxæ, and upper and under sides of the front and middle femora and tibiæ; hind legs gradually thickened, hind tarsal joints swollen, remainder of legs slender, simple. Halteres piceous. Wings cinereous-hyaline, stigma faintly fuscous, veins dark brown.

One male; California (Baron).

Empimorpha comantis Coquillett.

Proc. Nat. Mus., 1895, p. 396.

Head black, gray pollinose; pile of face mixed with black and white; eyes narrowly separated, the space between them being narrower than the width of the lowest ocellus, the upper facets being noticeably larger than the lower ones; antennæ black, the second joint reddish, slightly over one-third as long as the first; third joint subequal to the first, twice as long as broad; style slender, as long as the third joint; proboscis two and one-half times as long as the height of the head, projecting obliquely downward; palpi slender, curving upward, yellowish, the base brown, the pile black and white. Thorax black, shining, three vittæ and the broad lateral margins opaque gray pollinose; pile of thorax very abundant whitish, two longitudinal stripes of largely black pile on the dorsum; pleura black, thickly whitish pilose, destitute of stout bristles. Abdomen shining black, depressed, twice as long as wide; its pile very abundant, on the first two segments and the sides of the others largely whitish, on dorsum of the remaining segments mostly black; legs rather robust, reddish yellow; coxæ, under side of each femur, apex of each tibia and of each tarsal joint blackish; legs simple, the pile abundant. Halteres black. Wings hyaline, grayish towards the apex; veins, stigma and a spot above furcation of second and third veins dark brown. The female is the same as the above, except that the first abdominal segment and the bases of the next two are opaque gray pollinose. 11 mm.

Northern California (C. Fuchs).

PACHYMERIA Macquart.

Sparsely hairy species of stout aspect and gray-black color, very much resembling *Empis*. This genus grades into *Empis* and *Rhamphomyia*, but differs in that both sexes are dichoptic, that all the femora are about equal in length, and that the hind femora are strongly thickened.

Abdomen black, with white pollinose spots towards the apex... **pudica** Loew.
Abdomen unicolorous black..... **brevis** Loew.

Pachymeria pudica Loew.

Cent. i, 35.

Head dark cinereous. Antennæ black, first two joints cinerascens, sometimes partly fuscous. Proboscis very long. Thorax 4-vittate with fuscous, with short and sparse black hairs. Abdomen short, broad, black, shining, subglabrous, with fine pale hairs, longer at the base and at the basal part of the lateral margins;

last abdominal segment almost completely white-pollinose; the preceding segments marked on each side with a white-pollinose spot, very large in the female, but smaller and not reaching the posterior margins of the segments in the male. Hypopygium small; the upper appendages changed from lamellæ to small, swollen, ovate, dusky yellow, very short and very finely pubescent bodies; filament concealed. Coxæ dusky gray, yellowish towards apex; femora black, apically badius, sometimes wholly badius, below marked with a large black spot; tibiæ testaceous, base often broadly badius; tarsi testaceous, last joint black. Halteres whitish. Wings very pale cinerascens, veins fuscous. 5 mm.

District of Columbia (Osten Sacken).

Pachymeria brevis Loew.

Cent. ii, 22.

Head black, cinereous with pale pollen, occiput black-pilose. Antennæ black. Dorsum of thorax cinereous with pale pollen, very faintly sub-vittate, provided with rigid hairs and black macrochætæ. Scutellum concolorous with the thorax, with four marginal black bristles. Pleuræ black, cinereo-pollinose, and black-pilose. Abdomen rather broad, sub-depressed, black, and black-pilose. Hypopygium small, compressed, black, the lower lamellæ ovate, the central filament pale yellow, low, arcuate. Coxæ black, cinereo-pollinose, black-pilose. Wings cinerascens, veins fuscous. 4.2 mm.

District of Columbia (Osten Sacken).

ITEAPHILA Zetterstedt.

Small, blackish, rather thickly pubescent, *Empis*-like species. Antennæ longer than the head, plainly three-jointed, basal joints short, with erect hairs, last joint oval, bare, with a very short arista. Proboscis as long (female) or longer than the head, rather thick, horizontal, palpi lengthened. Eyes of male contiguous, of the female widely separated. The male abdomen small, with projecting anal appendages. Legs slender, simple. Wings with the third vein forked, the upper branch reaching straight to the costa; discal cell present, with three apical veins; anal cell shorter than the second basal, both bounded by a cross-vein almost parallel with the hind margin; anal angle strong.

Iteaphila Macquarti Zetterstedt.

Ins. Lapponica, 541, i.

Black, or piceous. Thoracic dorsum indistinctly vittate. Halteres black. Legs black with reddish knees. Wings brownish (male) or hyaline (female) with the veins plainly bordered with brown. 4 mm.

New Hampshire, Quebec.

Iteaphila perigrina sp. nov. (Fig. 97).

Length 3 mm.—Black, abdomen more or less piceous, feebly dusted and therefore sub-shining, provided with sparse, slender hairs; eyes of the male broadly

contiguous, their facets large, the lowest ones smaller, eyes of the female separated more widely than the ocelli, their facets as large as the smallest of the male; face of nearly uniform breadth. Proboscis very slender, extending straight forward, nearly one and one-half times the height of the head; palpi prominent, slender, extending beyond the epistome. Antennæ black, short, the basal joints short and thick, the third joint lanceolate, robust, the stout arista one-third the length of the third joint. Occiput with slender hairs. Thoracic dorsum evittate, but with the dorsicentral bristles prominent; scutellum with four slender bristles. Abdomen slender, long; hypopygium small, terminal, widely open. Legs very slender, simple, fuscous, the posterior tibiæ gradually and slightly thickened towards the apex; all the tibiæ provided with small terminal spurs; tarsi slender not spinose below. Halteres infuscated. Wings lightly infumated in the male, and clear hyaline in the female, veins narrow, fuscous, stigma indefinite; the furcation of the third vein acute, taking place beyond the tip of the marginal cell, sixth vein evanescent.

Seven specimens; San Diego Co., California (Wm. M. Wheeler).

This species, while differing from the typical *Iteaphila* by its very slender proboscis, is not a true *Empis*, and had best be included here.

MICROPHORUS Macquart.

Small, black, moderately hairy species. Of the European forms the antennæ are as long as the head, apparently two-jointed, with a short two-jointed arista; proboscis short, not projecting forward; palpi cylindrical; eyes bare, of both sexes separated, but approximate. Thorax hunchbacked. Abdomen of male blunt at the end, of the female pointed. Legs slender, bristly, the hind ones lengthened, tibiæ sometimes thickened apically. Third vein unforked; discal cell with three apical veins; anal cell shorter than the second basal cell, both bounded by one cross-vein, extending almost parallel with the hind margin; anal vein obsolete; anal angle almost rectangular.

Since Walker was familiar with at least one European species of *Microphorus*, *drapetoides* is left in the genus as given in its European sense. However, his selection for the specific name is not descriptive of the other species, and therefore his species probably does not conform with the characterization above given. The diagnosis is too meagre to allow any certainty to be placed on Mr. Walker's determination, and thus the location of *drapetoides* in the present genus is mere conjecture.

Microphorus drapetoides Walker.

List Dipt. Ins., iii, 489.

Body black, hairy; eyes piceous; feelers and lip black, the latter short; legs

piceous, clothed with short black hairs; wings dark brown, slightly tawny along part of the fore border from the base; wing-ribs and veins piceous. 2.5 mm.

St. Martin's Falls, Albany River, Hudson's Bay.

HOLOCLERA Schiner.

Small, nearly bare species of black coloration. The antennæ elongate, with the first joint minute, the third lengthened, lanceolate or attenuate, with an elongate style. Proboscis slender, horizontal. Eyes of the male contiguous. Thorax greatly hunchbacked. Male genitalia prominent, in our species pedunculate and flexed to the right. Legs more or less ciliated with fine hairs; the hind tibiæ and metatarsi thickened. Wings short and broad, with a simple third vein; discal cell emitting three veins; anal cell rounded, the anal vein not continued; anal angle rectangular, very prominent.

A genus previously unrecognized on this continent.

Body opaque gray pruinose.....**ravida** Coquillett.

Body not conspicuously gray pollinose.....2.

2. Thorax bilineate; halteres whitish.....**bilineata** sp. nov.

Thorax evenly dusted; halteres black.....3.

3. Under side of front femora devoid of cilia; wings infumated; stigma indistinct.

sycophantor sp. nov.

Under side of all the femora ciliate; wings clear hyaline; stigma distinct.

atrata Coquillett.

Holocera ravida Coquillett.

Microphorus ravidus Coquillett, Proc. Nat. Mus., 1895, p. 409.

Black, only the halteres whitish. Eyes contiguous, third antennal joint elongate, conical, the apical style slightly longer than the third joint; proboscis nearly perpendicular, from two-thirds as long to as long as the height of the head. Thorax, pleuræ, scutellum, and abdomen opaque gray pollinose, the bristles black, scutellum bearing four bristles; hypopygium rather large, bent around against the right side of the abdomen. Wings grayish hyaline, slightly smoky along the veins, stigma and veins brown, no vein issues from the anal cell; this cell is nearly as long as the second basal, the vein at its apex arcuate and not parallel with the hind margin of the wing. 2 mm.

The female differs from this in having the eyes broadly separated and the abdomen very blunt at the apex.

Southern California.

Holocera atrata Coquillett.

Microphorus atratus, Proc. Wash. Acad. Sci., 1901, p. 412.

Black, including the hairs; eyes of male contiguous, the third joint of antennæ orbicular on its basal half, the remainder narrowed into a styliiform process, style one and one-half times as long as the third antennal joint, proboscis less than half

as long as height of the head, body opaque, not pruinose, the hairs rather long, on the mesonotum abundant, on the abdomen sparse, scutellum bearing four bristles; under side of front and middle femora, both sides of the hind ones and outer side of hind tibiae ciliate nearly their entire length with rather long hairs, first joint of hind tarsi noticeably thicker than that of either of the other tarsi, much narrower than the hind tibiae; wings hyaline, veins and stigma brown, venation normal, last section of fifth vein two-thirds as long as the preceding section, sixth vein obsolete beyond end of anal cell. 2 mm.

Alaska.

Holoclera bilineata sp. nov. (Fig. 99).

Length 1.75 mm.—Black, covered with dark olivaceous gray dust. Eyes large, broadly contiguous, facets small. Antennae one-half the eye-height, first joint invisible, third joint lanceolate, the style two-thirds as long as the third joint. Proboscis very short, horizontal, hairy beneath; palpi short, black. Thorax remarkably hunchbacked, the dust obliterated on the dorsum along two narrow vittae, but bounding these becoming black; mesonotal bristles black, dense, short in front; scutellum with about six marginal bristles. Hairs of abdomen fine, yellow; hypopygium smaller than in the preceding species, pedunculate and flexed to the right, its parts not visible. Legs, including tip of coxae yellowish-brown, middle femora with a few apical cilia below, hind femora ciliate above and hind tibiae outwardly; hind tibiae enlarged and compressed, hind metatarsi distinctly enlarged, but not nearly as much so as the tibiae, as long as the three following joints only. Halteres yellowish. Wings clear hyaline, veins narrow, an elliptical brown stigma present; the vein between the discal cell and the third posterior three times that between the discal and the second posterior cells; the hind margin of the discal cell sub-equal to its prolongation.

Nine males; Opelousas, La. (G. R. Pilate).

Holoclera sycophantor sp. nov.

Length 2 mm.—Wholly black, opaque, dusted with dark olivaceous. Eyes large, broadly contiguous on the front, facets small. Antennae short, apparently two-jointed as the first joint is minute; third joint broad at the base then suddenly attenuate and lengthened, its style slender, one-half the length of the third joint. Proboscis shorter than the length of the head, horizontal; palpi conspicuous, black-bristly, porrect also. Occiput regularly ciliate with close bristles. Thorax sparsely black-bristly, the bristles long; scutellum with four bristles. Abdomen cylindrical, covered with long black bristles; hypopygium large, flexed toward the right, the central filament exposed at the tip, horizontal, piceous. Legs moderately short, especially the anterior pairs, stoutish, black, the upper side of all the femora, the lower side of the hind ones (and sparsely so on the middle ones), the outer side of all the tibiae, especially the hind ones, ciliate with black hairs; hind tibiae enlarged apically, but compressed; hind metatarsi a little larger than the other joints but of less length than the rest of the tarsus taken together. Halteres infuscated. Wings smoky, veins dark, stigma indistinct; the outward boundaries of the discal cell sub-equal.

Eight males; Idaho (Prof. J. M. Aldrich).

It may be noticed that only males of this genus have so far been taken in North America.

CYRTOMA Meigen.

Small, finely hairy species. Antennæ shorter than the head, apparently two-jointed, outer joint lanceolate or ovate, with a short end bristle. Proboscis short. Eyes bare, contiguous above. Thorax prominent, abdomen lengthened. Legs slender, posterior pair lengthened, with the tibiæ thickened apically; hind metatarsi long and more or less thickened. Wings with a simple third vein, no discal cell, three veins arise in the middle of the wing ending in the margin; anal cell shorter than the second basal, both bounded by a vein almost parallel with the hind margin; anal angle rectangular, prominent.

Hind femora incrassate, hybotine-like species, hind tibiæ yellowish at base....2.

Hind femora not incrassate, empidine-like species, legs black.....3.

2. Species measuring three millimeters, hind tibiæ three-fourth the length of their femora.....**femorata** Loew.

More than four millimeters long, hind tibiæ five-sixths the length of their femora.....**procera** Loew.

3. Halteres whitish, pile of abdomen dull whitish.....**halteralis** Loew.

Halteres blackish, pile of abdomen black in part.....4.

4. Legs moderately pilose, slender and piceous.....**longipes** Loew.

Legs strongly pilose, robust and jet black.....**pilipes** Loew.

Cyrtoma femorata Loew.

Cent. v, 69.

Black, antennæ concolorous, third joint lanceolate. Thorax cinereo-pollinose. Pile of thorax and scutellum sparse, black. Abdomen shining, with scattered white pile; segments on the front half obsoletely cinereo-pollinose. Legs long, black, black pilose, tips of the coxæ and the knees testaceous; hind femora thickened; front tibiæ rather stout; hind tibiæ thick, truncate, luteous, towards the tip black. Halteres whitish. Wings fusco-cinereous, veins fuscous, stigma obsoletely subfuscous. 3 mm.

New Hampshire (Osten Sacken).

Cyrtoma procera Loew.

Cent. v, 70.

Black, antennæ concolorous, third joint broad and ovate basally, slender apically. Thorax lightly cinereo-pollinose, its pile black. Abdomen shining, with scattered white pile. Legs long, black, black-pilose, apex of the coxæ and the knees luteous; hind femora incrassate; front tibiæ hardly thickened basally; hind tibiæ thick, obliquely truncate, luteous, towards tip black. Halteres whitish. Wings fusco-cinereous, veins fuscous, stigma obsoletely subfuscous. 4.5 mm.

Sitka, Alaska (Kolenati).

Cyrtoma halteralis Loew.

Cent. ii, 46.

Wholly black, somewhat shining. Pile of thorax and scutellum either wholly

or in part black, that of abdomen dirty white. Apically the hind tibiæ slightly incrassate. Halteres whitish. Wings pale fuscous, stigma saturate fuscous. 2.2 mm.

District of Columbia (Osten Sacken), Wisconsin (Wheeler).

Cyrtoma longipes Loew (Fig. 71).

Cent. ii, 47.

Wholly black, shining. Pile of the thorax and of the scutellum black. Pile of abdomen above black, along sides and beneath pale; abdomen of male above opaque. Legs longer and more slender than usual, moderately pilose, hind tibiæ somewhat thickened apically. Halteres dark brown. Wings blackish. 2.6 mm.

Massachusetts, New Hampshire, Wisconsin, Illinois, Wyoming, New Mexico.

Cyrtoma pilipes Loew.

Cent. ii, 48.

Black, shining. The pile of the thorax and scutellum, and partly that of the abdomen black. Legs rather strong and closely black-pilose, hind tibiæ a little thickened, especially apically. Halteres black; wings blackish. 3 mm.

Illinois (Le Baron), Alaska (Kincaid).

MYTHICOMYINÆ.

HILAROMORPHA Schiner.

Although *Hilaromorpha* has been assigned to the Leptidæ by most writers, it is included in the present paper mainly because in the tables of the only complete Manual of the North American Diptera, that of Dr. Williston, specimens of the genus would run to the Empididæ, and not because it is any firm belief of the writer that *Hilaromorpha* can be an Empid, and only an Empid.

Small, bare species of blackish gray color. Antennæ three-jointed, the first two joints short, the third lengthened, broad, toward the end suddenly narrowed, with a short two-jointed bristle. Proboscis short, projecting slightly; labellæ broad; palpi two-jointed, strongly thickened at the end, lamellate, as long as the proboscis. Eyes of the male contiguous on the front, of the female separated by the front. Three ocelli. Thorax strongly arched; abdomen arched posteriorly, transversely wrinkled, in both sexes pointed, in the males the projecting genitalia are attached to the small end of the abdomen; these consist of broad claw-like side pieces, which are brought together to form a thick, globose body. Legs slender, the hind ones somewhat lengthened. The third and fourth veins of the wing forked; discal cell wanting; anal cell broad up to the wing-margin, closed. Anal angle well-developed.

Legs black, except the yellowish knees.....**obscura** Bigot.
 Legs yellow, except the darkened tarsi**Mikii** Williston.

Hilaromorpha obscura Bigot.

Bull. Soc. Ent. France (6), vii (1887), p. cxl.

Ann. Ent. Soc. France, 1889, p. 129.

Entirely of an opaque black, except the yellowish knees; venter pruinose, and of a dark gray color; wings infumated, darker along the outer border, with an elongated, diffused, blackish stigma. 5 mm.

California.

Hilaromorpha Mikii Williston.

Psyche, 1888, p. 100.

Male.—Face opaque gray, with grooves from the oral margin. Antennæ brownish yellow; the third joint oval, a little longer than broad, the anterior borders straight or gently concave to the insertion of the slender two-jointed style, which is nearly as long as the body of the joint. Thorax in ground color black, thickly covered with opaque yellowish pollen on the mesonotum; on the pleuræ with lighter, less dense pollen. Abdomen with each segment anteriorly brownish black; posteriorly banded with opaque yellow, of a color somewhat lighter than that of the mesonotum. Legs yellow, the terminal joints of the tarsi infuscated. Wings blackish, a little lighter behind. 4 mm.

Carlinville, Illinois (Robertson).

MYTHICOMYIA Coquillett.

Body with no macrochætæ. Head globular, attached to a distinct neck. Antennæ porrect, two-thirds the height of the head, the first joint very short, the second as broad as long; the third broad, lanceolate, not annulate, nearly three times the second; style terminal, nearly one half as long and one third as broad as the third joint, very densely pubescent. Eyes of the male contiguous, and with an area of enlarged facets above. Three widely separated, equidistant ocelli present. Proboscis rigid, nearly as long as the head height, directed obliquely forward, no labellæ; palpi minute. Thorax greatly arched, in profile higher than long. Wings with the marginal cell closed, only one submarginal cell and four posterior cells, all open, as is also the anal cell; first section of the fourth vein colorless, the last (seventh vein) very weak. Legs rather stout, but none of the parts dilated, with no bristles, spines or other processes; front coxæ less than one half the length of the femora; pulvilli well developed, empodium bristle-like.

Tibiæ, halteres, first vein and second section of the costa yellow.

Rileyi Coquillett.

Tibiæ, except at base, black; upper side of knob of halteres also black; first vein and costa brown.....**tibialis** Coquillett.

Mythicomyia Rileyi Coquillett.

Ent. News, 1893, p. 209.

Black, the frontal triangle, face, humeri, base of the first and apices of the other abdominal segments, excepting the last, apex of femora, tibiae wholly, and the halteres white, the short sparse hairs also white; occiput, thorax and abdomen gray pollinose, the hypopygium shining, one and one-third times as high as long, shorter than but projecting one-fourth its height above the eighth abdominal segment. Wings wholly hyaline. 2.5 mm.

California; Mesilla Park, New Mexico (T. D. A. Cockerell).

Mythicomyia tibialis Coquillett.

Proc. Nat. Mus., 1895, p. 409.

Male.—Black, frontal triangle, face, cheeks, humeri and each hind corner of the thorax whitish; halteres, except upper side of the knob, hypopygium largely, knees and base of hind metatarsi yellowish. Head, sides of thorax, pleura and scutellum gray pollinose, abdomen deep velvet black; pile of head and body whitish. Wings wholly hyaline, veins black, the auxiliary and bases of the other veins yellowish. On the under side of the hind metatarsi, before its middle, is a rounded notch, in front of which is a round process. 3.5 mm.

Los Angeles Co., Calif. (Coquillett).

ADDITIONAL NOTES AND DESCRIPTIONS.

During the time the foregoing pages have been going through the press a number of additions have been made resulting from the courtesies of several gentlemen. Through the kindness of Mr. Samuel Henshaw the types of this family described by Dr. H. Loew have been examined at Cambridge, which has introduced a number of synonymical changes and brought to light several previously undescribed species. Charles W. Johnson, J. Chester Bradley and George M. Greene have each contributed to our knowledge of this family since the first collection was amassed. But the most important of the following additions are the result of an expedition to New Mexico during May and June of this year, undertaken by James A. G. Rehn and Henry L. Viereck, under the direction of the Philadelphia Academy of Natural Sciences. During one month's time, Mr. Viereck collected twenty-three species of Empididæ of which only eleven were previously described. The twelve other forms are included among the new species given in the main paper or are described below. I wish to thank Miss Mabel Evans also for her assistance in reading the proof of this article.

Page 205.

STILPON.

- Sides of front and vertex nearly parallel; hind metatarsi thickened and darkened2.
 Vertex broadened; hind metatarsi not thickened3.
 2. Veins bordered with brown; abdomen brick-red.....**varipes** Loew.
 Veins not bordered; abdomen blackish.....**pectinger** mihi.
 3. Thorax closely pollinose; first vein ending at middle of wing.
 Houghii mihi.
 Thorax shining; first vein ending before middle of wing.....4.
 4. Legs yellowish; basal cells equal, small.....**minuta** sp. nov.
 Legs black; second basal cell larger.....**nigripes** sp. nov.

Stilpon nigripes sp. nov.

Male and Female. Length 1 mm.—Black species. Eyes nearly contiguous on the face and just above the antennæ; vertex broadened. Proboscis short, incurved, black, palpi blackish, with dusky hairs. Antennæ black, the outer joint short ovate, rather pointed, not larger than the inner joint, the long seta subterminal. Thorax shining black, the sparse pubescence dusky, appressed, scutellum with two long and two short bristles. Abdomen subopaque, black, hypopygium large, gaping, the upper valve ascending, hood-shaped, shining, the lower portion pedunculate, projecting, provided with many short bristly hairs on the outer portion, a curved central exerted penis present. Legs black, short, robust, all the femora moderately thickened, no swellings nor ciliation. Halteres black. Wings clear hyaline, veins black, first vein much stronger than the others, ending at middle of costa, second vein ending midway between first and third, third and fourth veins parallel, fifth vein ending opposite the second vein, second basal cell broad and one-half longer than the first, its cross-vein nearly perpendicular.

One male and nine females. Alamogordo (Middle Sonoran); Highrolls (Upper Sonoran), and Cloudercroft (Canadian Zone), New Mexico. May and June, 1902. (H. L. Viereck.)

Stilpon minuta sp. nov.

Female. Length 1 mm.—Black, shining species, with yellow legs. Eyes contiguous just below and above the antennæ, front narrow, sides diverging, vertex broad, triangular. Antennæ dusky, the outer joint short, oval, the long seta subdorsal. Proboscis short, incurved, black, palpi small yellowish. Thorax and abdomen shining, their sparse hairs dusky, scutellum with two long and two shorter bristles. Legs including the coxæ dusky yellow, simple, not fringed, femora but little thickened. Halteres dusky. Wings hyaline, unspotted, veins dark fuscous, uniform, the second vein ends at the middle of the costa, second section of the costa about one-half the length of the third, third and fourth veins gradually diverging, basal cells short, equal, posterior cross-vein oblique, fifth vein ends beyond the second vein.

Three females; Cloudercroft and Highrolls, New Mexico. June, 1902. (H. L. Viereck.)

Page 207.

Drapetis nitida mihi.

Is the same as *unipila* Loew.

Page 210.

***Drapetis pubescens* Loew.**

The basal cells are large for this genus.

Page 212.

***Drapetis spectabilis* mihi.**

In the collection of the Museum of Comparative Zoology at Cambridge are three specimens from Bosque Co., Texas (Belfrage).

***Drapetis xanthopodus* Williston.**

Is the same as *gilvipes* Loew.

Page 214.

***Platypalpus lupatus* sp. nov.**

Male. Length 2.5 mm.—Black species, head and thorax overlaid with hair-like tomentum. Face white. Antennæ black, the outer joint oval, its style two and a half times its length. Proboscis black. Bristles of body and of legs dirty white, scutellum with two long and two short bristles. The glabrous space of the mesopleuræ small. Abdomen and hypopygium shining black, the latter twisted to the right, the basal edge of the under side with several long black hairs. Coxæ black, piceous apically; legs black, except towards the trochanters and knees, the hind tibiæ and the bases of the tarsal joints, which places are dull yellowish; front femora thickened as much as the middle ones, front tibiæ stouter than the middle ones, middle tibiæ with a strong apical spur, remainder of legs simple; legs with scattered yellowish hairs, longer beneath on the femora, front tibiæ with about ten longer hairs on the front edge, the hairs gradually becoming long below and not arranged in a definite series. Halteres yellow. Wings hyaline, veins fuscous, third vein straight, fourth vein slightly sinuous, subparallel with the third and slightly diverging from it at the tip, second basal cell the longer, its cross-vein oblique, the distance between the two cross-veins on the fourth vein less than the length of the anterior cross-vein, anal cross-vein straight, inflexed, evanescent, anal vein faint, obsolete at base.

One male; Cloudcroft, New Mexico. May 27, 1902. (H. L. Viereck.)

This species is associated with the eastern *pachynemus*, but in that form the antennæ are dark fuscous, the front femora but slightly thickened, the third vein incurved, converging with the fourth, while along the fore edge of the front tibiæ there is a series of but seven hairs, with a similar series also on the hinder edge. The hairs of the inner edge are finer and number eight. *Pachynemus* measures 2.3 mm.

***Platypalpus Vierecki* sp. nov.**

Male and Female. Length 2.5 mm.—Black pollinose species, with yellow legs. Face and front whitish, occiput cinereous, beneath with dense white hairs. Antennæ yellowish, extreme tip of the outer joint and the arista dusky, outer joint lanceolate, the arista but little longer than the antenna. Proboscis black, palpi prominent, yellow. Thorax with golden dust above, becoming cinereous on pleuræ, a small shining space present above the middle coxæ; bristles yellow, scutel-

lum with two moderately long and two short bristles. Abdomen dusted with gray, hypopygium small, black, terminal, not pollinose, upper piece with a close fringe of yellow bristles on the left side. Legs including coxæ pale yellow, tarsi strongly annulate with black, spur of middle tibiæ prominent, black, front femora nearly as thick as middle ones, fringed beneath with white cilia, middle femora and tibiæ with a double series of minute setulæ on under surface, front tibiæ slightly bowed and incrassate. Halteres whitish. Wings yellowish, veins yellow, anal vein obsolete at base, distance between the two cross-veins on the fourth vein somewhat greater than the length of the first cross-vein, second basal cell the longer, its cross-vein oblique, third and fourth veins parallel.

Var.—Ground color of abdomen becoming yellow.

Numerous specimens, the males predominating. Cloudcroft, New Mexico, May 27, 1902. H. L. Viereck, collector.

This species will run to *crassifemoris* in the table on page 215, *antêa*, but is sufficiently differentiated by its pollinose abdomen. Only two other of the previously described species of *Platypalpus* (*canus* and *incurvus*) have the abdomen pollinose, but as both of these have black antennæ the present form can be quickly recognized. The following species should also be compared.

***Platypalpus rufiventris* sp. nov.**

Male and Female. Length 2-2.5 mm.—Thorax black, gray dusted, abdomen testaceous, lightly dusted, subshining. Face and front whitish, occiput cinereous. Antennæ black, short, outer joint short, ovate, pointed, its bristle twice its length. Thoracic notum and abdomen with yellowish tomentum, pleuræ cinereous, the usual shining spot overlaid with pollen also, bristles yellow, scutellum with two moderate bristles. Abdomen lightly dusted, less so in the female, in the male dusky at the base, in the female reddish yellow, hypopygium small, blackish, with a few long yellow hairs extending laterally from the left side. Legs including the coxæ yellow, tarsi not annulate, their very tip dusky, spur of middle tibiæ black, front tibiæ not incrassate, front femora half as thick as the middle ones. Halteres yellow; wings as in *Vierecki*.

One male, seven females; Cloudcroft, New Mexico. June 17, 1902. (H. L. Viereck).

This and the variety of the preceding species are the only North American species of *Platypalpus* known with black thorax and red abdomen. It can be quickly distinguished from *Vierecki* by the shape and color of the antennæ, and by the uniform tarsal coloration.

Page 219.

***Platypalpus lætus* Loew.**

The tibial spur is as large as usual for this genus. The apices of the tarsal joints are scarcely darker than the rest. The third and fourth veins gently converge before the tip of the wing and then continue subparallel.

Platypalpus flavirostris Loew.

Loew's type specimen has four narrow dusky vittæ on the castaneous thoracic notum. Another female from the Osten Sacken collection is somewhat smaller and has no dark vittæ. The ground color of the head is black.

Page 222.

Platypalpus discifer Loew.

The middle tarsi of the male are greatly enlarged and flattened, and feathered along the edge with close black scale-like hairs.

The species *trivialis*, *aqualis* and *crassifemoris* of *Platypalpus* are all quite similar, and probably represent one extremely variable species. The characters chosen in the table will render the divisions somewhat homogeneous, but too much stress must not be laid on the infallibility of the separation. The species as defined in this way do not conform exactly with those Dr. Loew had in mind.

Page 225.

TACHYDROMIA.

Modify table as follows :

10. Wings with a black spot at outer third of costal margin.

maculipennis Walker.

Wings infumated, except the whitish base.....10a.

- 10a. Anal cross-vein wanting11.

Anal cross-vein present11a.

11. Legs black ; second basal cell shorter than first.....**nubifera** Coquillett.

Legs more or less yellowish ; second basal longer than first..**pusilla** Loew.

- 11a. Front tibiæ strongly incrassate ; first basal cross-vein oblique, second perpendicular**clavipes** Loew.

Front tibiæ not greatly thickened12.

12. Second basal cell but little exceeding the first, its cross-vein perpendicular ; proboscis reddish at base.....13.

Second basal cell longer than the first by at least the length of its oblique cross-vein ; proboscis black ; pleuræ shining.....**rapax** Loew.

13. Pleuræ shining ; front tibiæ with no teeth below ; middle femora more slender than front ones ; eastern species.....13a.

Pleuræ opaque ; front tibiæ closely mucronate with black setulæ below ; middle femora as thick as the front ones ; western species.

corticalis sp. nov.

- 13a. Front femora bare beneath ; hypopygium without bristles.

rostrata Loew.

Front femora ciliate beneath ; hypopygium with long black bristles above.

brachialis sp. nov.

Tachydromia nubifera Coquillett.

Fur Seals and Fur Seal Islands of N. Pacif. Ocean, 1898, iv, p. 343.

Male and Female.—Black, the bases of the halteres yellow ; hairs and bristles

black; head and thorax subopaque gray pruinose. Third joint of the antennæ oval, only slightly longer than the second. Wings grayish hyaline, the costal portion beyond the base of the submarginal cell extending from the costa to the fourth vein brown, the limits not sharply defined, second basal cell slightly shorter than the first, anal cell wholly wanting. Front femora only slightly thicker than the others. 3-4 mm.

Behring Island (Stejneger).

***Tachydromia corticalis* sp. nov.**

Male. Length 3.5 mm.—Black species covered with fine brown gray dust. Occiput grayish, with a few black bristles above and numerous white hairs below; front brownish. Antennæ yellow at the base, the outer joint and its seta infuscated. Proboscis reddish, with the tip darkened; palpi white, with a strong black preapical hair. Thoracic notum covered with brown-gray dust, the large humeri, the pleuræ and scutellum with more cinereous dust, scutellum with two erect widely separated bristles. Abdomen flattened, hypopygium large, shining black, globose, the copulatory portion twisted to the right, asymmetrical, consisting mainly of two large lamellate pointed valves, the one on the right with a bunch of short black hairs on its upper side, clasping a complicated short central piece bearing a short fringe of forward extending hairs, the last ventral is provided with a series of long black hairs. Coxæ and legs shining, piceous, front ones lighter, the four anterior femora swollen, of nearly equal thickness, front femora unarmed, ornate with two circular black spots on inner side below, one at the middle, the other half-way towards the apex; front tibiæ slightly thicker than the middle ones, armed beneath with a series of equidistant black setulæ, front metatarsi also with minute setulæ below; base of middle femora with a rough pencil of black bristles fitting into the excised tip of the middle tibiæ, middle tibiæ in length equalling their femora, provided with close minute setulæ on the under side; hind legs slender, their knees, middle part of tibiæ and base of metatarsi dull yellowish. Halteres dirty white. Wings and veins blackish on outer two-thirds, basal third whitish, anal vein vanishing at its tip, much recurved, the distance between the central cross-veins slightly less than the length of one of them, anterior cross-vein rather oblique, posterior cross-vein perpendicular.

Two males; Cloudercroft, New Mexico, June 19, 1902.

Mr. Viereck took these specimens, together with a series of *Tachydromia rapax*, running up and down the smooth trunks of the quaking aspen (*Populus tremuloides*), somewhat after the manner of the dolichopodid genera *Medeterus* or *Neurigona*.

***Tachydromia brachialis* sp. nov.**

Male. Length 4 mm.—Black species covered with cinereous dust except sides of thorax. Front and occiput cinereous dusted, lower occiput nearly devoid of white hairs. Antennæ yellow, the seta black. Proboscis reddish except the extreme dark tip, palpi white, provided with a single black apical hair. Humeri large, concolorous with the remainder of the dorsum, scutellum with two erect bristles, pleuræ shining black. Abdomen lightly cinereous dusted, the last seg-

ment and the globose hypopygium shining black, upper valves of hypopygium small, bristly, especially the right one, last ventral fringed with moderately long black hairs. Coxæ and legs yellowish, front coxæ with a fringe of hairs beneath, their forward side and the under side of the posterior trochanters with a black spot. Front femora with a black transverse dumb-bell-shaped mark at the middle of the under side, below which is a large elongate curved black space which spreads straight downward to the inferior edge along its lower loop; under side of the front tibiæ and of the hind femora piceous, hind tibiæ fuscous, tarsi infuscated apically; front femora incrassate, ciliate beneath with a double series of conspicuous dusky hairs, front tibiæ slightly incrassate, not setulate but provided with a number of fine short hairs, front metatarsi with minute setulæ; middle and hind femora slender, simple, middle tibiæ slightly surpassing the femora, scarcely indented towards tip. Halteres lightly infuscated. Wings infumated, darker beyond basal third, veins black, all the cross-veins straight, perpendicular, the distance between the central cross-veins equal to the length of the posterior one, anal cross-vein abrupt.

Described from one male taken by Mr. George M. Greene, September 9, 1901, at Boonton, N. J. This may possibly be the insect Mr. Walker described as *similis*, though from his description alone it is impossible to decide. It is a finely characterized species easily distinguished by the fringe on the front femora, which well merits the redescription should it eventually prove to be Mr. Walker's species.

Page 230.

Coloboneura inusitata mihi.

In the collection at Cambridge are two females from Rhode Island. They differ in no essential way from the description of the males. The humeral callostity is concolorous with the remainder of the thorax. The costa has a basal bristle rather longer than the others.

Page 232.

CHIROMANTIS Rondani.

Small, slender, sparsely hairy species of light yellow color. Antennæ short, three-jointed, the third joint ovate, with the seta bent downward. Proboscis shorter than the head. Eyes of female separated. Thorax rather prominently raised. Abdomen of male blunt at tip, of the female with a porrect two-styled ovipositor. Legs lengthened, front coxæ as long as the thickened femora. Wings long and narrow, third vein simple, discal cell present, with three veins issuing from it, or wanting, in which case the fourth vein is forked, anal cell shorter than the second basal, anal angle not filled. (Taken from Schiner's description of *Thamnodromia*).

The genus is related to *Litanomyia*, which differs in having the

thorax longer and more cylindrical, and the anal cell not shorter than the second basal.

Chiromantis vocatoria Fallen.

Fallen, Empid., p. 12, No. 15.

Head black. Antennæ yellow, the apex black; the long bristle-like seta white. Front white. Thorax yellow, infuscated above. Abdomen blackish, the venter pale. Legs pale, hind ones simple. Wings hyaline, the first vein short, second vein lengthened, third vein reaching the wing-margin at the extreme tip, fourth and fifth veins equal, forming the long discal cell, from which three veins reach the margin. The hind margin is fringed and rather stout.

This European species is given by Mr. Coquillett in Smith's "List" as from New Jersey.

SCIODROMIA Haliday.

Small, black, almost bare species. Antennæ short, two-jointed, the outer joint ovate, pointed, with a long bristle. Proboscis about as long as the head, fleshy, vertical or projecting forward. Palpi small, appressed to the proboscis. Eyes of both sexes nearly contiguous below the antennæ, widely separated above, the front very broad. Thorax moderately large. Hypopygium of male larger than the diameter of the abdomen, tip of the female abdomen blunt, ciliated. Legs slender, nowhere thickened. Wings long and narrow, all the veins unforked, discal cell moderately large, sending three veins to the wing-margin. Anal cell as long as the second basal, its cross-vein perpendicular. Wings not projecting at the anal angle.

The only important character in which the following species differs from the European type is in the structure of the front, which in Haliday's species is obliterated by the contiguity of the eyes of the male. *Sciodromia* can readily be separated from its near relatives by the following important characters.

Oreothalia has the anal cross-vein parallel with the hind margin.

Synamphotera bicolor has the proboscis incurved.

Ardoptera has the third vein furcate and the head long and narrow.

Sciodromia pullata sp. nov.

Male and Female. Length 2.5-3 mm.—Black species. Vertex, notum and hypopygium covered with olivaceous brown dust, occiput, pleuræ, abdomen and legs with rather more cinereous dust. The narrow face dusted with whitish. Arista slightly longer than the antennæ. Vertex and dorsum of thorax with very few short bristles, scutellum with two bristles. Hypopygium compressed, vertical, twice as deep as the abdomen. Legs slender, black, not spinose or

bristly, unguis and pulvilli minute. Halteres yellow. Wings slender, evenly infumated, no stigmal darkening, veins blackish, second and third veins subparallel toward tip, anal vein evanescent beyond anal cell.

Two males and three females taken in sweepings near the summit of the Las Vegas Range, New Mexico, June 28, 1902 (altitude 11,000 feet), by Mr. H. L. Viereck.

Page 240.

Modify table of **CLINOCERA**.

- | | |
|--|---------------------------|
| 2. Discal cell very oblique apically; two submarginal cells..... | 3. |
| Discal cell moderately broad toward tip..... | 4. |
| 3. Second submarginal as long as second basal cell..... | simplex Loew. |
| Second submarginal longer..... | lepida mihi. |
| 4. Stigma obsolete..... | 5. |
| Stigma distinct..... | 6. |
| 5. Anal vein strong..... | dolicheretma mihi. |
| Anal vein faint..... | conjuncta Loew. |

Page 242.

Clinocera conjuncta Loew.

Although the description states that the discal cell is small and apically very oblique, the type shows it to be of other conformation. The contact with the second posterior cell is quite broad. Hence *taos* turns out to be closely allied. The first and second posterior cells are of almost equal width at their proximal end. The first section of the front border of the discal cell is slightly over one third the length of the second section. The thorax is olivaceous except a median cinereous stripe between the two black vittæ. The stigmal darkening is scarcely visible.

Page 252.

SYNECHES Walker.

Modify table thus:

- | | |
|--|-----------------------------------|
| 6. Stigma quadrangular..... | quadrangularis Wh. et Mel. |
| Stigma elliptical, diffused.... | 7. |
| 7. Wings grayish; legs comparatively simple..... | debilis Coquillett. |
| Wings brown, hind femora spinose beneath..... | longipennis sp. nov. |

The white pollinose spots of the thorax of *albonotatus* are best seen when looked at from above.

Syneches longipennis sp. nov.

Male. Length 6 mm.—Rather large, slender species of black body-color. Eyes wine-red, occiput dusted with cinereous. Antennæ, palpi, and proboscis yellow. Thorax and abdomen thinly overlaid with cinereous dust, moderately coated with yellow hairs, thorax relatively little raised, evittate, scutellum with about fifteen hairs; abdomen slender, hypopygium small, terminal, sessile. Coxæ piceous, legs reddish, hairy, hind femora greatly thickened, spinose below and with four spinous bristles on upper-outer edge, last tarsal joint black. Hal-

teres infuscated. Wings brown, narrow, stigma but little darker, veins piceous-brown, marginal cell not widened.

One male; Hertford Co., N. Car., June 9, 1895. (C. W. Johnson).

In stature this species resembles *thoracicus* and *rufus*, but differs conspicuously in the smaller thorax, more elongate abdomen, and different venation. From the smaller species *longipennis* is at once distinct by its bristly femora and darkened wings.

Page 256.

Oedalea ohioensis mihi.

This is the species given in the New Jersey "List" as *stigmatella* Zett. The following notes made from the New Jersey specimen may be of service. Antennæ two-jointed, the first joint minute, the outer joint large, broad, blunt, equalling the eye-height, the arista minute. Scutellum with four bristles. Legs testaceous. Halteres pale yellow. Stigma very weak, the interstitial vein reaching two-thirds the distance to the margin. Another female differs from the New Jersey specimen in that the wings are nearly clear and the interstitial vein is perfect.

Page 256.

EUTHYNEURA Macquart.

Discal cell open, fourth vein furcate.....**aperta** sp. nov.

Discal cell normal.....2.

2. Discal cell large, *i. e.*, last section of the fifth vein not more than two-thirds the length of the preceding section.....3.

Discal cell smaller, the two sections of the fifth vein nearly equal.....6.

3. Proboscis at least one-half the height of the head; scutellum with eight or more hairs. Western species.....4.

Proboscis not projecting; scutellum with four hairs. Eastern species

nura sp. nov.

4. Black species.....5.

Yellow species, with a median vitta brown.....**erocata** Coquillett.

5. Highly polished species.....**flavipilosa** Coquillett.

Opaque species.....**stentor** sp. nov.

6. Proboscis projecting forward, rigid.....**bucinator** sp. nov.

Proboscis minute, fleshy.....7.

7. Outer joint of antennæ circular large; basal cells small..**bulbosa** sp. nov.

Outer joint of antennæ slender, long; second basal cell large.

atripes sp. nov.

The North American species included in this genus belong more properly with the Empidinae as they are here defined, but they show a transition toward the Hybotinae in that the thorax is greatly arched, the anal cross vein is not so strongly inclined as usually is

the case in the Empidinae, and the proboscis of some of the species at least, projects forward.

***Euthyneura bucinator* sp. nov.**

Female. Length 2.5 mm.—Shining black species with yellow legs. Face and front broad, diverging, shining. Proboscis rigid, black, extending obliquely forward, as long as the height of the head. Thorax bare, highly polished, including the pleuræ; scutellum with six black bristles. Abdomen subshining, brownish towards base. Coxæ and legs yellow, simple, slender, the claws minute. Halteres yellowish. Wings clear hyaline, veins yellow, no stigma, discal cell as long as the second basal, its hind border as long as the outward continuation of that vein, anal vein faint.

One female; Pennsylvania. The antennæ are broken. This is a typical *Euthyneura*: the five other new species conform less perfectly.

***Euthyneura aperta* sp. nov.**

Male. Length 2.5 mm.—Slender black species, with yellowish legs. Head large, eyes contiguous, the upper facets large. Antennæ inserted low, the second joint broad lanceolate, the style minute. Proboscis rigid, extending straight forward, nearly as long as the head-height. Thorax sparsely pubescent, shining on the pleuræ also; scutellum with six equally long bristles. Abdomen slender, pubescent with whitish to dusky hairs and bristles, sides of first segment with a fringe of white hairs; hypopygium small, simple, narrow, obliquely ascending, black-pubescent. Coxæ and legs yellow, their short sparse hairs black, legs simple, slender, the hind tibiæ slightly thickened, claws and pulvilli small. Halteres pale yellow. Wings hyaline with a faint opalescence, veins white, stigma almost obsolete, whitish, second basal cell broad, discal cell open apically, the fourth vein forked midway its length, anal vein faint, vanishing.

A single male; Cloudcroft, New Mexico. May 27, 1902. (H. L. Viereck).

This species is placed in *Euthyneura* as it departs from typical forms in no more salient characters than do the other species here included. In other genera, e. g., *Thamnodromia*, *Hemerodromia*, or *Rhampomyia*, the discal cell is often incompletely formed.

***Euthyneura stentor* sp. nov.**

Male. Length 3. mm.—Opaque black, rather slender species. Head rather large, eyes broadly contiguous, facets large above. Antennæ short, inserted low, the second joint elongate conical, suddenly narrowed at the base and then gradually tapering, style short, plainly two-jointed, the first joint thick. Thorax covered with long bristly black hairs; scutellum with ten long hairs. Abdomen cylindrical, deflexed, pubescent with sparse hairs; hypopygium small, consisting of two small deflexed black-bristly valves, and a central forward-extending, trumpet-shaped piece. Legs slender, moderately long, the femora ciliate above and beneath with regular sparse hairs, claws and pulvilli conspicuous. Halteres black. Wings lightly infumated, stigma elliptical blackish, veins narrow, black-

ish, the intercalary vein arises near the fourth posterior vein, discal cell one-third longer than the enlarged second basal, its posterior border one-half longer than the outer continuation of that vein, anal cross vein parallel with the hind border of the wing, forming an even continuation of the vein bounding the second basal cell, anal vein completely obsolete.

One male; Cloudcroft, New Mexico, May 27, 1902. (H. L. Viereck.)

Euthyneura nura sp. nov.

Female. Length 3 mm.—Shining black with reddish legs. Eyes nearly contiguous on the face; front of moderate width. Proboscis and palpi minute, black. Antennæ black, shorter than the head-height, the outer joint compressed, large, two-thirds as deep as long, its style one-third its length. Thorax with sparse hairs, notum and pleura strongly polished, scutellum with four dusky hairs. Abdomen slender, polished black, its sparse pubescence dusky. Coxæ and legs yellowish, simple, rather strong, rather densely pubescent, the tips of the hind tibiæ and of the tarsi somewhat dusky, claws and pulvilli small but plain. Halteres yellowish. Wings cinereous hyaline, with broad dusky yellow veins, stigmal spot dusky, filling out the tip of the marginal cell, second vein straight, widely diverging from the third, discal cell one-third longer than the second basal, the vein between the third and fourth posterior cells two-thirds that between the discal and fourth posterior cells, anal vein faint.

One female; Massachusetts.

Euthyneura bulbosa sp. nov.

Male. Length 1.5–2 mm.—Opaque black. Eyes contiguous on the front, upper facets larger. Proboscis short and fleshy, reaching forward. Antennæ short, the second joint large, compressed, circular, the style shorter than the radius of the joint. Thorax very large, provided with short black bristles, scutellum with four long black bristles. Abdomen short, blunt, black-bristly, venter gray pruinose, hypopygium not formed. Legs short and slender, simple, black, tarsi with short bristles, claws small, pulvilli minute. Halteres black. Wings short and broad, cinereous hyaline, veins fuscous, stigma nearly obsolete, discal cell one-third longer than the second basal, the basal cells not enlarged, anal cross vein nearly parallel with the hind margin of the wing, anal vein evanescent, reaching three-fourths to the margin.

Female.—Eyes widely separated. Thorax, abdomen, halteres and legs except tip of tarsi, reddish yellow. Veins reddish. Abdomen pointed.

Numerous specimens collected by Mr. J. Chester Bradley, in net-sweepings, in Chester Co., Pa., during the early part of last June.

Euthyneura atripes sp. nov.

Female. Length 2 mm.—Black species. Head opaque black, face narrow, sides of front parallel, separated as widely as the posterior ocelli. Proboscis short, fleshy, extending forward. Antennæ as long as the height of the head, the outer joint five times as long as deep, slender, not much tapering, its arista equalling its depth. Thorax shining, nearly bare, pleuræ and abdomen lightly dusted with cinereous; scutellum with ten black hairs. Coxæ and legs black,

simple, legs slender, a row of scattered hairs along the under edge of the femora, claws and pulvilli large, empodium minute. Halteres black. Wings large, cinereous hyaline, veins fuscous, a diffused brown stigmal spot present, discal cell as long as the second basal, its hind border about three-fourths as long at the outer continuation of that vein.

A single specimen from Los Angeles Co., California, December 22, 1896. (W. M. Wheeler).

Page 259.

MEGACYTTARUS Bigot.

Although Mr. Coquillett claims that the mutilated specimen upon which this genus was founded is the same as *Rhamphomyia limbata* Loew, the suppression of the genus seems hardly justifiable on the slight evidence he gives. It is true the diagnosis applies equally well to *Rh. limbata*, but *Megacyttarus* is grouped by M. Bigot with *Ocydromia* which has a projecting proboscis and a truncate anal cell, characters of importance which M. Bigot would hardly overlook. Hence until more definite information is to be had concerning the type the genus and species may be reinstated.

"Allied to *Ocydromia*. It differs in the short basal cells and the very long, broad, roughly triangular discal cell which is closed by a greatly sinuous transverse vein placed near the hind margin of the wing."

Megacyttarus argenteus Bigot.

Bull. Soc. Ent. France, 1880, xlvii.

Female. Length 5 mm.—Cinereous, the four vittæ of the thorax, the proboscis, the whole of the legs, the extreme tip of the abdomen, and the small stigmal spot of the wings black; abdomen silvery; wings hyaline.

Colorado.

Page 264.

Hilara umbrosa.

This is the species given in the New Jersey "List" as *Empis brachystoma* Coquillett MSS.

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Modify table of **EMPIS** as follows:

- | | |
|---|-------------------------------|
| 21. Pile of pleuræ and of abdomen in part pale, or wanting..... | 22. |
| Hairs of bristles of thorax and abdomen wholly black..... | 31. |
| 22. Species of three mm., size; antennæ reddish at base..... | 23. |
| Larger species..... | 24. |
| 23. Abdomen more or less yellow; veins brown..... | compta Coquillett. |
| Abdomen wholly black; veins white..... | varipes Loew. |
| 24. Knob of halteres black; abdomen largely shining..... | 25. |
| Knob of halteres yellow; abdomen opaque pollinose..... | 26. |
| 25. Mesonotal hairs white..... | comantis Coquillett. |
| Mesonotal hairs black..... | brachysoma Coquillett. |

26. Woolly species; scutellum with many bristles....**scatophagina** sp. nov.
Less pubescent species; scutellum with eight or fewer bristles.....27.
27. Scutellum with six to eight bristles.....**obesa** Loew.
Bristles of scutellum four or less.....28.
28. Pile of body luteous.....**Aldrichii** mibi.
Pile of body white or wanting.....29.
29. Species devoid of hairs; wings clear hyaline, sixth vein evaneacent.
neomexicana sp. nov.
More or less pubescent species; sixth vein normal.....29a.
- 29a. Scutellum with two bristles; dorsum of abdomen brown pollinose; legs of
female ciliate with black scales.....**captus** Coquillett.
Scutellum with four bristles.....30.
30. Stigma brown, wings gray, abdomen blue-gray pollinose.
a vida Coquillett.
Stigma wanting, abdomen more or less brownish above.....30a.
- 30a. Antennæ and proboscis yellow at base.....**levicula** Coquillett.
Antennæ and proboscis black.....**vaginifer** sp. nov.

Empis scatophagina sp. nov.

Male. Length 9 mm.—Stout black species, densely clothed with mixed yellow and dusky woolly pubescence, the darker hairs prevailing on the mesonotum. Eyes contiguous; facets uniform. Face covered with brown-gray pollen. Antennæ short, black, third joint lanceolate, one-third as wide as long, its style two-thirds its length. Palpi porrect, ribbon-like, luteous, with a few long black forward-extending hairs beneath. Proboscis slender, black, reaching to the tip of the middle coxæ. Occiput densely covered with dusky pubescence above and with yellowish below. Thorax with four narrow glabrous vittæ, the outer pair abbreviated behind, densely covered with pubescence, the darker hairs slightly longer and directed posteriorly, the lighter hairs shorter and straighter, especially on the humeri where the dense yellow hairs extend forward. Above the base of the wings and at the posterior end of the middle vittæ are bunches of black bristles; scutellum bearing about twenty bristles; metapleuræ with a dense mat of yellow hairs; pleuræ cinereous dusted. Abdomen cylindrical, stout, somewhat shining, with long dense yellow pubescence; no ventral projections; hypopygium comparatively small, outwardly fulvous, closed, globose, its lower valve with a fringe of yellow hairs, central filament hidden, except at base, middle lamellæ scarcely larger than upper ones. Coxæ black, dusted with gray and provided with yellow pubescence; middle and hind ones with a row of longer black hairs along outer side; trochanters black, shining. Legs dark castaneous, shining, not thickened, unarmed, provided with short black bristles; tarsi piceous, black apically. Halteres yellow. Wings lightly and evenly infumated, stigma faint, elongate and very narrow, veins narrow, dark brown, normal, anterior branch of the third vein oblique and curved, discal cell two-thirds as long as the ultimate section of the fourth vein.

Female.—Differs thus: eyes widely separated; pubescence shorter; front and hind edges of middle and hind femora ciliate with short black scale-like hairs; inner edge of hind tibiæ likewise fringed, but not so densely.

One male and one female. Sitka, Alaska, in the Loew collection in the Museum of Comparative Zoology, Harvard University.

This species is closely related to *obesa* Loew, but differs in the much denser vestiture of the body.

***Empis neomexicana* sp. nov.**

Male and Female. Length of body 6 mm., of wing 9 mm.—Black species, finely dusted with brownish pollen, devoid of all pile and bristles, the extremely short and sparse pubescence of the body and legs whitish. Occiput gray dusted. Antennæ black, moderately long, the third joint lanceolate, its style short and thick. Palpi short, pale yellow; proboscis black, nearly three times the height of the head. Thorax with four brown vittæ, obliterated in front of the scutellum; scutellum and metapleuræ with no bristles. Abdomen cylindrical, the basal segments dusky yellowish in the male, hypopygium not large, erect, pedunculate by the flattened projecting basal piece, upper lamellæ fleshy, yellow, middle lamellæ black, triangular, their free ends touching and encircling a deflexed curved spur-like process, from the base of the forward side of the hypopygium arise a pair of long erect filiform reddish styles. Coxæ and legs yellow, hind legs from middle of femora outward dusky, legs simple and slender in both sexes. Halteres yellow. Wings hyaline, veins dark brown, thin, stigma faint, elongate, situated far from the tip of the marginal cell, which extends considerably beyond the furcation of the third vein, second section of the front border of the discal cell five times the length of the first section, its hind border equal to the outward continuation of that vein, anal vein wanting in the male, evanescent in the female.

One male and one female from the top of the Las Vegas Range, New Mexico, June 28, 1902, altitude 11,000 feet. (H. L. Viereck).

***Empis vaginifer* sp. nov.**

Male. Length 5 mm.—Black, thickly overlaid with fine silvery-gray dust. Eyes broadly contiguous above the antennæ, facets uniform and small. Face with brownish dust. Antennæ short, black, not bristly, the third joint twice as long as broad, its arista equal to its breadth. Palpi slender, short, yellow; proboscis nearly twice the height of the head, black. Occiput gray dusted, with two irregular rows of sparse short black bristles above, and below with a small bunch of fine white hairs on each side in back of the cheeks. Thorax dusted with gray, almost devoid of hairs, the acrostichals and dorsi-centrals short and sparse, humeral and lateral bristles stronger; notum provided with four rather broad slaty-brown vittæ; scutellum with four short bristles; pectus with a few white hairs; metapleuræ with a fine bunch of white hairs. Abdomen depressed, cinereous-dusted, the basal segments provided with sparse white hairs laterally; the seventh dorsal segment strongly convex, almost hemispherical, the eighth minute, together with the small hypopygium hidden within the large tubular testaceous eighth ventral segment, which is produced at its upper basal angles into two stout cylindrical processes articulating with suitable callosities on the sixth dorsal. Coxæ rufous, but overlaid with cinereous dust, provided outwardly with a few short bristles, those of the base of the front ones whitish, the others black. Legs rather shining, testaceous, their bristles small, the outer ends of the tarsal joints somewhat more dusky; tarsal joints evenly decreasing in length, the front and middle tarsi cylindrical, the hind metatarsi and hind tibiæ as thick

as the femora, the inflation of the tarsus gradually subsiding apically; pulvilli reddish. Halteres large, yellow. Wings clear hyaline, stigma wanting, the veins pale brown, normal, third vein furcate beyond the marginal cell, the hind border of the discal cell two-thirds the length of the outward continuation of that vein.

One male, District of Columbia. In the Osten Sacken Collection at the Museum of Comparative Zoology, Cambridge, Mass.

Page 298.

Empis longipes Loew.

In the male the tips of the front coxæ, the forward side of the middle ones and the outer half of the hind ones, together with the underside of the hind trochanters are provided with conspicuous black bristles. The hind trochanters are bordered apically with black. In the female, the hairs are shorter and the black of the trochanters is reduced to a spot. The male hypopygium is densely covered with fine dusky hairs on the outer portion of the middle lamellæ, while the lower valve is fringed with fine black bristles.

Page 301.

Empis armipes Loew.

The armament of the hind legs of the male is much like that of *mizopolia*.

Page 304.

Empis stenoptera Loew.

Dr. Loew makes no mention of an important secondary sexual character of this species. The underside of the hind trochanters of the male is provided with a fringe of black spiny scales, which places the species in a group with *nuda* and *cacuminiifer*.

Page 309.

Empis obesa Loew.

This species measures eight mm. instead of three as given in the Centuries. Having been led astray by this fact, Mr. Coquillett established his *ravida* upon the same form.

Page 322.

The dubious *poplitea* is the same as *serperastrorum*, the description of which will have to go under the name of Loew's species.

Page 330.

Empimorpha comantis Coquillett.

A male and a female, also from San Francisco, collected by Mr. H. Edwards, are in the Loew collection at Cambridge. The male is

typical, but the female departs from Mr. Coquillett's type. In this specimen the hirsuteness of the body is much reduced, on the face almost completely disappearing, and elsewhere shorter and sparser than in the male. The chætotaxy of the coxæ is similar for both sexes. Both also have a series of short black bristles on the under-side of the middle and hind femora. The structure of the hypopygium, as well as the whole habitus, suggests the group *obesa* of *Empis*, which, in consideration of the nearly glabrous face, renders the validity of Mr. Coquillett's genus somewhat precarious.

Page 332.

***Iteaphila orchestris* sp. nov.**

Male and Female. Length 5 mm.—Deep opaque black over all, the thorax of the female with dark brown dust, rather hairy species. Eyes of the male contiguous on the front, of the female very widely separated. Antennæ equalling the height of the head, first two joints moderately large, barrel-shaped, with but few hairs, third joint twice as long as basal two, elongate-lanceolate, not much tapering, blunt, its short arista two-jointed, the first joint thick, the second minute. Proboscis about as long as the head-head, extending straight forward, stouter than in *peregrina*, palpi slender, equalling the proboscis in length, and applied to it, provided with numerous black hairs. Face bare, occiput covered with dense black pubescence. Thorax moderately pubescent, the hairs sparser and longer posteriorly, the pubescence wanting on two vittæ of piceous color, scutellum with a fringe of about twenty long hairs; abdomen moderately pubescent basally. The vestiture of the female is much reduced, and not of such a deep black color. Genitalia of the male small, consisting of several projecting filamentous appendages. Legs slender, the knees sometimes brownish, the femora of the male with regular sparse black cilia above and below. Halteres black, the pedicels yellowish in the female. Wings of the male rather pointed, very lightly infumated, stigma elongate, narrow, smoky, veins black, third vein furcate quite a distance beyond the tip of the marginal cell, the submarginal cell therefore small; of the female, the wings are hyaline, the veins dark fuscous, becoming yellow at the base, the apex is blunter, while the third vein is furcate just beyond the end of the marginal cell, stigma faint.

Described from numerous specimens taken by Mr. H. L. Viereck, June 28, 1902, near the top of the Las Vegas Range, New Mexico, at an altitude of 11,000 feet. The species differs apparently from *macquarti* in that the veins are not at all bordered with brown, and the third antennal joint is not oval. From *peregrina* it can be readily distinguished by the hirsute body and shortened proboscis.

These flies were swarming over a small creek-bed in an anæmotropic dance so characteristic of many of the members of this sub-family.

CATALOGUE OF THE NORTH AMERICAN SPECIES OF EMPIDIDÆ.

MYTHICOMYIINÆ.

Mythicomyia Coquillett.

- Rileyi* Coq. Calif.
tibialis Coq. Calif.

Hilaromorpha Schiner.

- Mikii* Willist. Ill.
obscura Big. Calif.

TACHYDROMIINÆ.

Phoneutisca Loew.

- bimaculata* Lw. Alaska, S. Dak. Fig. 1.
simplicior Wh. et Mel. Mex. Fig. 6.

Stilpon Loew.

- varipes* Lw. Penn.
Houghii sp. nov. Mass. Figs. 2, 3.
pectiniger sp. nov. Mass., Wisc. Figs. 4, 5.
minuta sp. nov. N. Mex.
nigripes sp. nov. N. Mex.

Drapetis Meigen.

- unipila* Lw. Tex., Cal. Figs. 10, 14, 21.
medetera sp. nov. Colo., Ariz., Wyom. Fig. 22.
nigra Meig. S. Dak. Figs. 12, 17, 24.
dividua sp. nov. Id. Figs. 16, 18, 23.
latipennis sp. nov. Wis., Ks. Figs. 11, 19.
apicis Willist. St. Vincent.
pubescens Lw. N. Y.
divergens Lw. Ga., Ala., Tex. Fig. 15.
minuta Willist. St. Vincent.
femoralis Wh. et Mel. Mex. Fig. 13.
septentrionalis sp. nov. Mich.
spectabilis sp. nov. Mass., Tex. Figs. 9, 20.
gilvipes Lw. Tex., St. Vincent, Ga.
flavida Willist. Yucatan, Mex., W. Ind., La.

Elaphropeza Macquart.

- montana* sp. nov. Colo. Figs. 7, 8.

Platypalpus Macquart.

- trivialis* Lw. Me., Mass., D. C. Figs. 26, 34, 43.
caligatus sp. nov. Mex. Figs. 27, 35, 46.
lupatus sp. nov. N. M.
pachynemus Lw. D. C., N. J.

- monticola* sp. nov. Col. Fig. 41.
pluto sp. nov. Id., Cal. Fig. 39.
apicalis Lw. Penn., N. Y., Mass.
diversipes Coq. Alaska.
incultus Coq. Cal., Tex.
tersus Coq. N. Car., Ga., La.
impexus sp. nov. Mich., S. Dak.
lætus Lw. N. H.
flavistrotris Lw. N. H.
mesogrammus Lw. N. J., D. C., Penn., Tenn.
vicarius Walk.
canus sp. nov. Cal. Figs. 29, 40, 45.
hians sp. nov. Col. Figs. 32, 36, 37.
inops sp. nov. Wyom., Id.
incurvus sp. nov. Cal. Figs. 31, 33, 34.
gravidus sp. nov. Cal. Figs. 25, 42.
lateralis Lw. N. H.
discifer Lw. D. C.
hastatus sp. nov. Ks., Id., N. Mex. Fig. 30.
æqualis Lw. Mass., Quebec, Id., La., Cal.
crassifemoris Fitch. Mass., Mich., Id., Penn.
tenellus sp. nov. Ill., S. D. Figs. 28, 38.
gilvipes Coq. Alaska.
rufiventris sp. nov. N. Mex.
Vierecki sp. nov. N. Mex.

Tachydromia Macquart.

- Schwarzii* Coq. Tex., Mex., Id. Wyom., Cal. Fig. 52.
enecator sp. nov. Quebec, Wyom.
bacis Walk. Jamaica.
vittipennis Walk.
inusta sp. nov. N. Mex., Id. Figs. 50, 54.
portæcola Walk. H. Bay.
Winthemi Zett. N. H.
postica Walk. Ks. Fig. 53.

fenestrata Say. Mid. States.
similis Walk. H. Bay.
maculipennis Walk. H. Bay.
clavipes Lw. Ill.
pusilla Lw. Mass., N. J., Ill. Fig. 51.
rostrata Lw. N. H., Mass.
rapax Lw. Mass., Ind., Wis., Wyom.,
 N. Mex. Fig. 55.

nubifera Coq. Bering Is.
corticalis sp. nov. N. Mex.
brachialis sp. nov. N. J.

Coloboneura gen. nov.

inuitata sp. nov. Fla., Mass., R. I.
 Figs. 47-49.

HEMERODROMIINÆ.

Hemerodromia Meigen.

scapularis Lw. Me., Penn., Md., Tenn.,
 Wyom., N. Mex. Fig. 59.
mexicana sp. nov. Mex. Figs. 56, 60.
collusor sp. nov. Col., Wyom. Figs.
 57, 58, 64.
defecta Lw. D. C., N. J.
superstitiosa Say. N. W. Terr., Fla.
rogatoris Coq. N. C., La., Queb., Wis.,
 Wyom. Fig. 65.
empiformis Say. Pa., Fla., N. J., Ill.,
 St. Vincent? N. Y.?
defessa Willist. St. Vincent.
captus Coq. N. Y.
albipes Walk. H. Bay Terr.
notata Lw. Ill.
valida Lw. H. B. Terr.
præcatoria Fall. H. Bay Terr.
obsoleta Lw. Ill.
palloris Coq. N. H.

Litanomyia gen. nov.

mexicana Wh. et Mel. Mex.
elongata sp. nov. Mass., Can. Wis.,
 S. D.

Chiromantis Rondani.

vocatoria Fall. N. J.

Synamphotera Loew.

bicolor Lw. Alaska.

Oreothalia gen. nov.

pelops sp. nov. Id.

Sciodromia Haliday.

pullata sp. nov. N. Mex.

Rœderiodes Coquillett.

juncta Coq. N. Y.

Ardoptera Macquart.

irrorata Fall. Europe, N. Am.

Clinocera Meigen.

simplex Lw. H. Bay Terr.
lepida sp. nov. Id.
dolicheretma sp. nov. Id.
conjuncta Lw. D. C.
taos sp. nov. N. H.
lecta sp. nov. Id.
binotata Lw. N. Y., Quebec.
maculata Lw. D. C.
lineata Lw. Penn., Wash. Figs. 61, 62.
fuscipennis Lw. N. H.
maculipes Big. Cal.

HYBOTINÆ.

Meghyperus Loew.

occidens Coq. Cal.
nitidus sp. nov. Id. Figs. 72, 73.

Syneches Walker.

albonotatus Lw. D. C.
hyalinus Coq. Md.
pusillus Lw. W. Ind., N. Y., Wis.,
 Ks., Fla.

debilis Coq. Ga., D. C., Md.
quadrangularis Wh. et Mel. Mexico.
 Fig. 85.
rufus Lw. N. Y., Ohio, Ill., Wis.
thoracicus Say. Pa., N. C., Ky., Ill.
 Fig. 84.
simplex Walk. Mass., N. C., Ga., Fla.,
 Wisc., Ont. Fig. 86.
longipennis sp. nov. N. C.

Syndyas Loew.

dorsalis *Lw.* N. Y., Ill.
 polita *Lw.* Mass., La., Ks. Fig. 83.

Hybos Meigen.

typicus *Wh. et Mel.* Mex.
 spinicosta *Wh. et Mel.* Mex. Fig. 77.
 mellipes *Wh. et Mel.* Mex. Fig. 78.
 electus nom. nov. W. Ind., Mass., La.,
 Fla.
 Slossonæ *Coq.* Mass., N. H., Wis.
 reversus *Walk.* N. J.
 triplex *Walk.* Yucatan, Mex., Mass.,
 Fla., Col. Fig. 79-81.
 sequens nom. nov. Mex.

Oedalea Meigen.

ohioensis sp. nov. Ohio, N. J. Figs.
 74-76.

Leptopeza Macquart.

flavipes *Meig.* Va. (Europe). Fig. 68.
 disparilis sp. nov. Cal., Id. Fig. 69.
 compta *Coq.* Mass., Ohio, Wis., Ill.,
 Tenn. Fig. 70.

Ocydromia Meigen.

glabricula *Fall.* Wis., Wyom., N. Mex.,
 Vanc. Figs. 66, 67.

Megacyttarus Bigot.

argenteus *Big.* Col.

Brachystoma Meigen.

Robertsonii *Coq.* Ohio, Tenn., Ill.
 occidentalis sp. nov. Id., Wash. Fig. 80.

Blepharoprocta Loew.

nigrimana *Lw.* Ill.
 binummus *Lw.* D. C., Ohio. Figs. 91, 92.
 serratula *Lw.* Ga., Tenn. Fig. 90.

EMPIDINÆ.

Empimorpha Coquillett.

barbata *Lw.* Cal. Fig. 106.
 comantis *Coq.* Cal.
 geneatis sp. nov. Cal. Fig. 105.

Pachymeria Stephens.

pudica *Lw.* D. C., Va., Penn., N. J.,
 Clouderoft, N. Mex.
 brevis *Lw.* D. C.

Empis Linneaus.

annulipes *Wh. et Mel.* Mex. Fig. 115.
 montezuma *Wh. et Mel.* Mex. Fig. 114.
 bicolor *Bell.* Mex. Figs. 112, 113.
 atrifemur *Wh. et Mel.* Mex. Figs. 116,
 117.
 azteca *Wh. et Mel.* Mex. Fig. 119.
 pegasus O. S. Mex.
 xochitl *Wh. et Mel.* Mex. Fig. 118.
 totipennis *Bell.* Mex.
 spiloptera *Wied.* Mex.
 clausa *Coq.* Tex., S. D., Ill., Ohio.
 Fig. 129.
 asema sp. nov. Tex. Fig. 130.
 triangula *Coq.* Alaska.
 labiata *Lw.* D. C.

distans *Lw.* Conn., Penn., La., Ga.
 Fig. 127.

dolorosa *Wh. et Mel.* Mex. Fig. 128.
 cormus *Walk.* H. Bay Terr., Col. ?
 luctuosa *Kirby.* Brit. Am.
 gulosa *Coq.* Ill.
 humile *Coq.* Ill.
 poeciloptera *Lw.* N. Y.
 longipes *Lw.* N. Y., Penn
 sordida *Lw.* D. C.
 abcius *Walk.* Ga.
 eudamidas *Walk.*
 amytis *Walk.* N. Y.
 olius *Walk.* N. Scot.
 laniventris *Esch.* Unalaska, Bering
 Is., Copper Is.
 colonica *Walk.* N. Scot.
 leptogastrea *Lw.* D. C.
 armipes *Lw.* N. Y.
 tridentata *Coq.* Penn. Fig. 132.
 pallida *Lw.* N. Y.
 rufescens *Lw.* N. H., Mass. Fig. 120.
 rubida *Wh. et Mel.* Mex. Fig. 121.
 otiosa *Coq.* Ill., Conn., Ks., La., Mass.
 Fig. 122.
 Johnsoni sp. nov. Penn. Fig. 123.

enodis sp. nov. Ill. Fig. 125.
caecuminifer sp. nov. Ohio, Ala. Fig. 124.
stenoptera *Lw.* N. H.
nuda *Lw.* Ill., Montreal. Fig. 126.
compta *Cog.* Ill., La.
varipes *Lw.* Pa.
levicula *Cog.* Ill.
neomexicana sp. nov. N. Mex.
vaginifer sp. nov. D. C.
scatophagina sp. nov. Alaska.
avida *Cog.* Ill.
comantis *Cog.* Cal.
brachysoma *Cog.* Alaska. Fig. 110.
Aldrichii sp. nov. Id., Oreg. Fig. 110.
obesa *Lw.* N. H., Mass., Ga., Id., Wash. Fig. 111.
captus *Cog.* N. Car., Ga.
tersa *Cog.* N. Car.
tenebrosa *Cog.* Tex.
spectabilis *Lw.* Md., N. J. Pa. Fig. 109.
laevigata *Lw.* N. H.
virgata *Cog.* Wash., Br. Col. Fig. 108.
pellucida *Cog.* Alaska.
fumida *Cog.* Alaska.
infumata *Cog.* Alaska.
cæligena sp. nov. Ala. Fig. 107.
teres sp. nov. Id. Figs. 133, 142.
loripedis *Cog.* Ill., Ohio, Penn. Fig. 131.
gladiator sp. nov. Ks. Fig. 134.
arthritica sp. nov. Pa. Figs. 135, 144.
podagra sp. nov. Id.
mira *Big.* Cal.
Bigoti nom. nov. Cal.
manca *Cog.* Cal.
valentis *Cog.* Cal. Fig. 138.
clauda *Cog.* Alaska.
poplitea *Lw.* Alaska, Vanc., Id., Col., N. Mex. Figs. 136, 145.
aerobatica sp. nov. Cal., Id.
nodipes sp. nov. N. Mex. Fig. 143.
dolabraria sp. sp. Cal.
falcata sp. nov. Id., Cal., N. Mex. Fig. 137.
canaster sp. nov. Id., Oreg. Figs. 139, 140.
æripes sp. nov. Id. Fig. 141.
mixopolia sp. nov. Id.

Hilara Meigen.

viridis *Cog.* Jamaica.
testacea *Lw.* N. H., N. J.
lutea *Lw.* D. C., N. J.
femorata *Lw.* N. J., N. Y., Md., Ohio, Wis.
aurata *Cog.* Me., Alaska.
umbrosa *Lw.* Mass., Ill.
basalis *Lw.* Ill.
quadrivittata *Meig.* Alaska.
leucoptera *Lw.* Fla., N. J.
bella sp. nov. Mass. Fig. 94.
macroptera *Lw.* D. C.
congregaria sp. nov. Cal.
Johnsoni *Cog.* Ala.
tristis *Lw.* N. H., N. J.
mutabilis *Lw.* Ill., N. J.
trivittata *Lw.* Ill., Ala., Tex.
nugax sp. nov. Cal.
cana *Cog.* Cal.
baculifer sp. nov. Ga. Fig. 96.
unicolor *Lw.* Mass., Md.
velutina *Lw.* D. C.
atra *Lw.* Mass., Ill., Col., N. Mex.
carbonaria sp. nov. Mass.
brevipila *Lw.* Ill.
gracilis *Lw.* Pa., N. J.
nigriventris *Lw.* Pa.
seriata *Lw.* N. H., N. J.
Wheeleri *Mel.* Wyom. Fig. 95.

Gloma Meigen.

rufa *Lw.* N. H.
obscura *Lw.* N. H., Id. Fig. 93.
scopifera *Cog.* Alaska.

Ragas Walker.

mabelæ sp. nov. Id. Fig. 98.
conjuncta *Cog.* Alaska.

Hormopeza Zetterstedt.

bullata sp. nov. Wyom. Fig. 88.
brevicornis *Lw.* S. Dak., Id., Wyom., Alaska. Fig. 87.
nigricans *Lw.* Id., Alaska.

Lamprempis Wheeler et Melander, gen. nov.

violacea *Lw.* Mex. Figs. 103, 104.

superba Lw. Cuba.
cyanea Bell. Mex.
suavis Lw. Mex.
chichimeca Wh. et Mel. Mex. Figs.
 100, 101, 102.
diaphorina O. S. Mex.
benigna O. S.

Iteaphila Zetterstedt.

peregrina sp. nov. Cal. Fig. 97.
 Macquart Zett. N. H., Quebec.
orchestris sp. nov. N. Mex.

Microphorus Macquart.

drapetoides Walk. H. Bay Terr.

Holoclera Schiner.

ravida Coq. Cal.
atrata Coq. Alaska.

sycophantor sp. nov. Id.
bilineata sp. nov. La. Fig. 99.

Euthyneura Macquart.

flavipilosa Coq. Br. Col.
crocata Coq. Alaska.
bucinator sp. nov. Penn.
nura sp. nov. Mass.
atripes sp. nov. Cal.
bulbosa sp. nov. Penn.
stentor sp. nov. N. Mex.
aperta sp. nov. N. Mex.

Cyrtoma Meigen.

halteralis Lw. D. C., Wis.
femorata Lw. N. H.
procera Lw. Alaska.
longipes Lw. Mass., Wyom., N. H.,
 Ill., N. Mex. Fig. 71.
pilipes Lw. Ill.

EXPLANATION OF THE PLATES.

PLATE V.

- Fig. 1. *Phoneutisca bimaculata* Lw., wing.
 " 2. *Stilpon Houghii* sp. nov., antenna.
 " 3. " " hypopygium.
 " 4. " *pectiniger* sp. nov., wing.
 " 5. *Elaphropeza montana* sp. nov., wing.
 " 6. *Phoneutisca simplicior* Wh. et Mel., wing.
 " 7. *Elaphropeza montana* sp. nov., wing.
 " 8. " " antenna.
 " 9. *Drapetis spectabilis* sp. nov., wing.
 " 10. " *unipila* Lw., wing.
 " 11. " *latipennis* sp. nov., wing.
 " 12. " *nigra* Meig., wing.
 " 13. " *femoralis* Wh. et Mel., wing.
 " 14. " *unipila* Lw., right hind leg.
 " 15. " *divergens* Lw., wing.
 " 16. " *dividua* sp. nov., wing.
 " 17. " *nigra* Meig., antenna.
 " 18. " *dividua* sp. nov., apical joint of antenna.
 " 19. " *latipennis* sp. nov., antenna.
 " 20. " *spectabilis* sp. nov., right antenna from above and inside.
 " 21. " *unipila* Lw., outer side of the right antenna.
 " 22. " *medetera* sp. nov., right antenna.
 " 23. " *dividua* sp. nov., hypopygium.

Fig. 24. *Drapetis nigra* Meig., hypopygium.

- " 25. *Platypalpus gravidus* sp. nov., antenna.
- " 26. " *trivialis* Lw., antenna.
- " 27. " *caligatus* sp. nov., antenna.
- " 28. " *tenellus* sp. nov., antenna.
- " 29. " *canus* sp. nov., antenna.
- " 30. " *hastatus* sp. nov., antenna.
- " 31. " *incurvus* sp. nov., antenna.
- " 32. " *hians* sp. nov., antenna.
- " 33. " *incurvus* sp. nov., wing.
- " 34. " *trivialis* Lw., wing of male.

PLATE VI.

Fig. 35. *Platypalpus caligatus* sp. nov., wing of male.

- " 36. " *hians* sp. nov., head.
- " 37. " " wing of male.
- " 38. " *tenellus* sp. nov., hypopygium.
- " 39. " *pluto* sp. nov., wing.
- " 40. " *canus* sp. nov., wing.
- " 41. " *monticola* sp. nov., hypopygium.
- " 42. " *gravidus* sp. nov., wing.
- " 43. " *trivialis* Lw., hypopygium.
- " 44. " *incurvus* sp. nov., hypopygium.
- " 45. " *canus* sp. nov., hypopygium.
- " 46. " *caligatus* sp. nov., hypopygium from above.
- " 47. *Coloboneura inusitata* sp. nov., head.
- " 48. " " wing.
- " 49. " " antenna.
- " 50. *Tachydromia inusta* sp. nov., wing.
- " 51. " *pusilla* Lw., hypopygium.
- " 52. " *Schwarzii* Coq., wing.
- " 53. " *postica* Walk., hypopygium.
- " 54. " *inusta* sp. nov., hypopygium.
- " 55. " *rapax* Lw., hypopygium.
- " 56. *Hemerodromia mexicana* sp. nov., wing.
- " 57. " *collusor* sp. nov., antenna.
- " 58. " " hypopygium.
- " 59. " *scapularis* Lw., hypopygium.
- " 60. " *mexicana* sp. nov., hypopygium.

PLATE VII.

Fig. 61. *Clinocera lineata* Lw., wing.

- " 62. " " antenna.
- " 63. *Litanomyia mexicana* Wh. et Mel., wing.
- " 64. *Hemerodromia collusor* sp. nov., hypopygium.
- " 65. " *rogatoris* Coq., hypopygium.
- " 66. *Ocydromia glabricula* Fall., antenna.
- " 67. " " hypopygium.

Fig. 68. *Leptopeza flavipes* Meig., antenna.

- " 69. " *disparilis* sp. nov., hypopygium.
- " 70. " *compta* Coq., hypopygium.
- " 71. *Cyrtoma longipes* Lw., wing.
- " 72. *Meghyperus nitidus* sp. nov., antenna.
- " 73. " " wing.
- " 74. *Oedalea ohioensis* sp. nov., leg.
- " 75. " " wing.
- " 76. " " hypopygium.
- " 77. *Hybos spinicosta* Wh. et Mel., wing.
- " 78. " *mellipes* Wh. et Mel., wing.
- " 79. " *triplex* Walk., hypopygium.
- " 80. " " antenna.
- " 81. " " antenna.
- " 82. *Lactistomyia insolita* gen. et sp. nov., leg.
- " 83. *Syndyas polita* Lw., wing.
- " 84. *Syneches thoracicus* Say, wing.
- " 85. " *quadrangularis* Wh. et Mel., wing.
- " 86. " *simplex* Walk., wing.

PLATE VIII.

Fig. 87. *Hormopeza brevicornis* Lw., hypopygium.

- " 88. " *bullata* sp. nov., antenna.
- " 89. *Brachystoma occidentalis* sp. nov., whole insect.
- " 90. *Blepharoprocta serratula* Lw., wing.
- " 91. " *binummus* Lw., hypopygium.
- " 92. " " side view of the hypopygium.
- " 93. *Gloma obscura* Lw., wing.
- " 94. *Hilara bella* sp. nov., leg of male.
- " 95. " *wheeleri* Mel., front leg of male.
- " 96. " *baculifer* sp. nov., fore leg of male.
- " 97. *Iteaphila peregrina* sp. nov., hypopygium.
- " 98. *Ragas mabelæ* sp. nov., hypopygium.
- " 99. *Holoclera bilineata* sp. nov., wing.
- " 100. *Lampremis chichimeca* Wh. et Mel., wing.
- " 101. " " hypopygium.
- " 102. " " hind leg of male.
- " 103. " *violacea* Lw., hypopygium from above.
- " 104. " " hypopygium from the side.
- " 105. *Empimorpha geneatis* sp. nov., hypopygium.
- " 106. " *barbata* Lw., hypopygium.
- " 107. *Empis cæligena* sp. nov., male abdomen.
- " 108. " *virgata* Coq., male abdomen.

PLATE IX.

Fig. 109. *Empis spectabilis* Lw., hypopygium.

- " 110. " *Aldrichii* sp. nov., hypopygium.
- " 111. " *obesa* Lw., hypopygium.
- " 112. " *bicolor* Bell., wing of male.

Fig. 113. *Empis bicolor* Bell, middle tarsus of male.

- " 114. " *montezuma* Wh. et Mel., hypopygium.
- " 115. " *annulipes* Wh. et Mel., front tarsus.
- " 116. " *atrifemur* Wh. et Mel., front tarsus.
- " 117. " " antenna.
- " 118. " *xochitl* Wh. et Mel., hind metatarsus.
- " 119. " *azteca* Wh. et Mel., wing.
- " 120. " *rufescens* Lw., hypopygium.
- " 121. " *rubida* Wh. et Mel., wing.
- " 122. " *otiosa* Coq., hypopygium.
- " 123. " *Johnsoni* sp. nov., hypopygium.
- " 124. " *cacumifer* sp. nov., hypopygium.
- " 125. " *enodis* sp. nov., hypopygium.
- " 126. " *nuda* Lw., hypopygium.
- " 127. " *distans* Lw., wing.
- " 128. " *dolorosa* Wh. et Mel., wing.
- " 129. " *clausa* Coq., wing.
- " 130. " *asema* sp. nov., hypopygium.
- " 131. " *loripedis* Coq., hypopygium.
- " 132. " *tridentata* Coq., hypopygium.
- " 133. " *teres* sp. nov., hypopygium.
- " 134. " *gladiator* sp. nov., hypopygium.
- " 135. " *arthritica* sp. nov., hypopygium.
- " 136. " *poplitea* Lw., hypopygium.
- " 137. " *fulcata* sp. nov., hypopygium.
- " 138. " *valentis* Coq., hypopygium.
- " 139. " *canaster* sp. nov., hypopygium.
- " 140. " " hind leg of male.
- " 141. " *xeripes* sp. nov., hind leg of male.
- " 142. " *teres* sp. nov., hind leg of male from inside.
- " 143. " *nodipes* sp. nov., hind leg of male from outside.
- " 144. " *arthritica* sp. nov., hind leg of male from outside.
- " 145. " *poplitea* Lw., hind leg of male from inside.

NOTE.—This paper was accepted by the faculty of Arts, Science and Literature of the University of Texas as a thesis for the degree of Master of Science.

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ERRATA.

- Page 195, line 2, for *Dipteron*, read *dipterous*.
- " 198, " 5, " anal canal, read anal cell.
- " 200, " 15, " ærial, read aerial.
- " 201, " 12, " ærobotica, read *aerobatica*.
- " 205, *Stilpon pectiniger*, line 5, fourth word, read asymmetrical.
- " 209, line 2, for *niger* read *nigra*.
- " 213, *Drapetis gilvipes*, reference should read Cent. x, 61.
- " 232, *Litanomyia elongata*, line 9, second word, read parallel.
- " 233, line 6, fifth word, read acrostichals.
- " 233, *Oreothalia pelops*, size should read 3 mm.
- " 245, *Clinocera maculipes*, reference should include p. 118.
- " 246, last line of table, for *triples* read *triplex*.
- " 247, *Hybos mellipes*, reference should include p. 373.
- " 247, " " line 6, third word, read cinerascens.
- " 250, line 7, for *Scelobates*, read *Scelolabes*.
- " 256, *Oedalea ohioensis*, line 6, for prealar, read prealar.
- " 281, *Lampremis diaphorina* and *benigna*, references should read, Biol. C-Am., Dipt., 1887, p. 215.
- " 284, line 7, third word, read account.
- " 284, second half of first division of table should go to No. 21.
- " 288, division 66, second part, read *aerobatica*.
- " 290, read *Empis atrifemur*.
- " 292, *Empis pegasus*, for Suppl. read 1887.
- " 335, third line of table, seventh word, read three-fourths.
- " 339, line 6, read **pectiniger**.
- " 342, line 13, third word, read infallibility.
- " 350, table of *Empis*, second line, second word, for *ot* read *or*.
- " " " third line, *dele*, after mm.
- " 351, line 7, last word, read evanescent.









